

FLIGHT

The
AIRCRAFT ENGINEER
AND AIRSHIPS

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Founder and Editor: STANLEY SPOONER

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DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list—

1931	
Jan. 14	"Armoured Cars in Desert Warfare," R.U.S.I. Lecture, by Sqdn.-Ldr. G. E. Godsave. 3 p.m.
Jan. 15	"Rigging and Assembly of Aircraft," Lecture by W. E. Vick, before R.Ae.S.
Jan. 17	Association Football: R.A.F. v. Corinthians, Wycombe.
Jan. 22	"Aeroplane Controls, Faults and Diagnosis," Lecture by W. James, before R.Ae.S.
Jan. 22	"Deck Flying," Lecture, by Sqdn.-Ldr. W. R. D. Acland, before R.Ae.S., Gloucester.
Jan. 22	"Model Aeroplanes," Lecture, by W. Rigby, before Westland Aircraft Soc.
Jan. 28	"Glider Construction," Lecture, by C. H. Lowe-Wylde, before London Gliding Club.
Jan. 28	Association Football: R.A.F. v. Football Assoc. XI., Uxbridge.
Jan. 29	"Development and Construction of Sailplanes and Gliders," Lecture, by Herr A. Lippisch, before R.Ae.S.
Jan. 29	"Machining and Working of Stainless Steel," Lecture, by R. Waddell, before Westland Aircraft Soc.
Jan. 30	"Gliding and Soaring," Lecture, by Col. the Master of Sempill, before R.Ae.S., Hull.
Feb. 5	"Wapiti in Australia," Lecture, by Sqdn.-Ldr. C. T. Anderson, before Westland Aircraft Soc.
Feb. 6	De H. Aeronautical Technical School Ball, at Portman Rooms.
Feb. 11	"Future of Aeroplane Design for the Services," R.U.S.I. Lecture, by C. R. Fairey. 3 p.m.
Feb. 11	Association Football: R.A.F. v. Civil Service, Uxbridge.
Feb. 12	"Air Navigation," Lecture, by Capt. N. Macmillan, before R.Ae.S. and G.A.P.A.N.

EDITORIAL COMMENT



FINANCIALLY speaking, the year which has just come to a close was not one which is likely to be remembered with pleasure in the years to come. The general depression—not merely a local one, but of world-wide extent—necessarily had its effects on the aviation industry, in spite of the fact that a large percentage of the British aircraft industry is dependent upon, and lives by Government orders, and thus is not as immediately affected by the ups and downs of trade as are many other industries. From a technical point of view, however, 1930 was rather a memorable year in the history of British aviation. It is doubtful whether ever before so many new types of aircraft were produced in any one year, and the variety of the types which took the air during the past year was such as to inspire optimism in looking to the future. There were 'planes ranging from 35 h.p. to 2,000 h.p., from a gross weight of a few hundred pounds to some 10 tons. There were monoplanes and biplanes, single, twin, three and four engined. There were land-planes, seaplanes, flying boats and amphibians. In short, Great Britain produced, during 1930, almost every type of aircraft imaginable, heavier-than-air and lighter-than-air.

Out of the wealth of material which was produced last year, or which was at least completed and tested last year, it is no easy matter to form a clear opinion of the technical progress which all these new types represent. That they were not all equally successful may be admitted, but on the other hand, one cannot quote from memory a single instance of any 1930 aircraft which was an out-and-out failure. Which seems to show that if we have not achieved anything very brilliant, neither have we brought forth anything of which we need be ashamed.

To FLIGHT it is a very particular pleasure to be in a position to put down 1930 as a marine aircraft year. Never before in our aviation history have British firms produced so many new types of flying boat in one year. Including machines which, it is true,

were laid down in 1929, but which did not emerge until 1930, we had, from the Supermarine works, the "Southampton X" and the air yacht, from Saunders-Roe, the civilian types Cutty Sark, Windhover and Cloud, in amphibian form as well as plain flying boat, and the A.7 service type. Shorts at Rochester gave us the Singapore II, one of the fastest flying boats in the world, the "Valetta" twin-float monoplane, and the "Calcutta" service type, as well as beginning construction of the large four-engined boats for Imperial Airways. And the Blackburn firm produced the "Sydney" three-engined monoplane flying boat. Truly a rather remarkable output for one year.

In the service class of aircraft, the outstanding event of the year was the production of a number of interceptor fighters, some of which were actually designed and built before 1930, but were mostly completed and tested last year. Ultimately, the Hawker "Fury" was the type chosen, and is now being built for the R.A.F. Other firms who, although not succeeding in winning the competition, produced remarkable aircraft in this class were: Bristols, the De Havilland Company, Fairey Aviation Co., Glosters, Parnall's, Vickers, and Westlands. Of other high-performance machines which reached the squadrons during the past year may be mentioned the Hawker "Hart" bomber, which also, like the Fairey "Fox," was experimentally fitted with a steam-cooled engine.

Of civil aircraft, a whole host appeared during 1930, ranging from small, single-seater light 'planes to 40-seater commercial aircraft. No detailed reference to the various new types is necessary here, as they have all been described and illustrated in FLIGHT, but the mere mention of type names will probably surprise by the extent of the list. Of machines for the private owner, marketed during 1930, there were: The Avro Avian Sports, the Comper "Swift," the de Havilland "Puss Moth," the Desoutter Mark II, the Hendy 302, the Robinson "Redwing," the Segrave "Meteor," the Southern "Martlet," the Spartan "Arrow," and the Watt D.W.2, not to mention certain experimental types which have not yet been offered to the public.

Among the larger and more powerful types, designed for commercial rather than private flying, the year saw the introduction of the Handley-Page 42, the Vickers "Viastra I," "Viastra II," and "Vellore II," and the building in considerable numbers of the Westland "Wessex."

Among the "unorthodox" aircraft which have undergone development during the year, it may be said that the Cierva "Autogiro" principle has now reached a stage of development where a machine

can be built which comes within measurable distance of the performance of the more normal type, while the non-stalling, non-spinning and steep descent qualities are such as to be equalled by no fixed-wing aircraft.

In the aero engine world it may be said that the outstanding innovation of 1930 was the introduction of the Napier "Rapier" 16-cylinder air-cooled engine. The Armstrong-Siddeley Company brought out several new types during the year, thus closing the, actually very small, gap which previously existed in their range of engines. The Rolls-Royce firm, by providing three distinct propeller-reduction gear ratios, two compression ratios, a normally aspirated type, and two degrees of supercharging, have provided no less than 12 varieties of their "F" type engine, and the Bristol Company has produced two geared and medium supercharged commercial "Jupiters," designed to fill the gap between the naturally-aspirated engines and the fully supercharged as used in certain types of service aircraft. The de Havilland company marketed during the year the "Gipsy II" and "Gipsy III" engines, the Cirrus Company's "Hermes II" came into extensive use, while the inverted "Hermes" was fitted in a few machines. The aero engines being developed by Sir William Morris have not yet been placed on the market, but will doubtless find their way to the front during the present year. All that may be said of them at present is that they are radial air-cooled. Aero engine development of the immediate future promises to be chiefly in the direction of the compression-ignition engine.

For British airships the year was a lamentable one, the successful flight of R 100 to Canada and back scarcely counterbalancing the terrible calamity which overtook R 101 and resulted in the loss of so many valuable lives.

Many notable flights were made in 1930, such as that of Captain Barnard and the Duchess of Bedford to the Cape and back, Barnard's flights, first to Malta and back in two days, and then to Tangier and back in two days. Kingsford Smith's flights from Ireland to Newfoundland and, later, his flight from England to Australia in less than 11 days must also rank among the successful flights of the year, although FLIGHT has never disguised its disapproval of long transoceanic flights in landplanes. The flight of Mr. Caspareuthus from London to Capetown in 9½ days also showed what can be done in the way of quick air transport by a determined pilot.

The aircraft specially designed to carry air mails for which FLIGHT has been agitating, did not materialise during 1930, but we have hopes for 1931.

NEW YEAR HONOURS

THE following are amongst the names included in the New Year Honours list, issued on January 1:—

Order of the Bath

C.B. (Military Division)

Air-Commodore Patrick Henry Lyon Playfair, M.C., R.A.F.

Order of the British Empire

(Civil Division)

O.B.E.

Robert Stanley Capon, Esq., Superintendent of Scientific Research, Royal Aircraft Establishment, Air Ministry.

M.B.E.

Stuart Davey, Esq., Staff Officer, Air Ministry.

Awards to Airmen

Air Force Cross

Sqdn.-Ldr. John Allan Cecil Wright, T.D. (Auxiliary Air Force).

Flight-Lieut. Gilbert Edward Nicholletts.

Flight-Lieut. Edward Simeon Colbeck Davis.

Air Force Medal

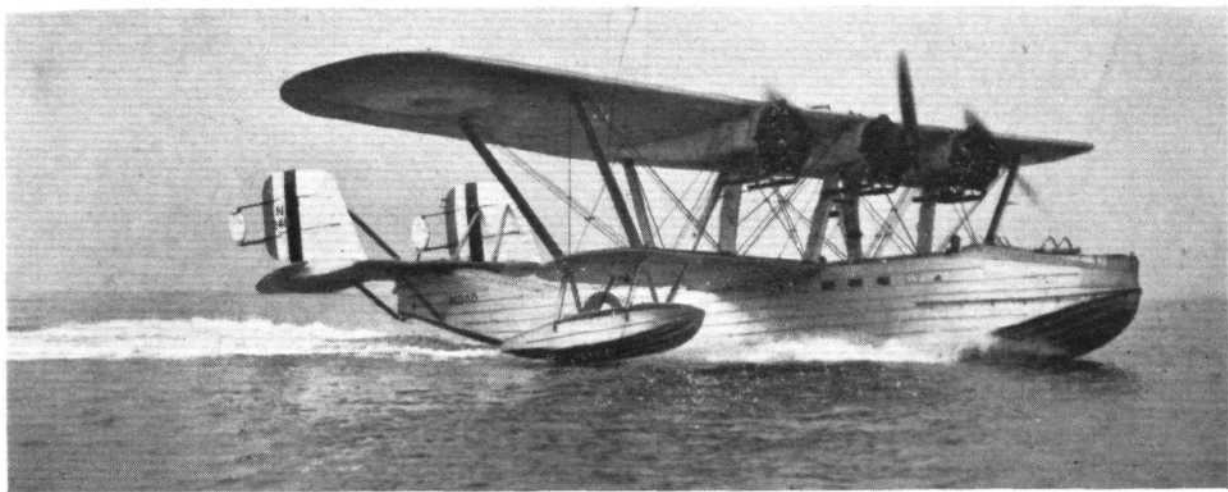
361911 Sergt. Alfred Victor Bax.

British Empire Medal

(Military Division)

For Meritorious Service

155288 Flight-Sergt. Edward Victor Hibberd, R.A.F.



THE SAUNDERS-ROE A7 FLYING BOAT

Three Bristol "Jupiter" IX Engines

THE Saro A.7, designed and built by Saunders-Roe, Ltd., of Cowes, is one of the largest military flying boats built in this country, and is designed to carry out the same duties as the Saro "Valkyrie," namely naval co-operation, or open sea reconnaissance and coastal patrol as an independent and self-contained unit.

Constructed entirely of metal, with stainless steel largely employed in the structure, the Saro A.7 is a sesquiplane flying boat of smart appearance, and capable of high performance. The machine has been so designed that it is easy to maintain under service conditions; whilst its quick take-off, smooth alighting and clean running make it very serviceable for its work as a seagoing craft.

The hull, which is constructed on the Saro patent principle, has an interior which is light and roomy, and permits freedom of movement inside from end to end. The bow cockpit is equipped for mooring, towing, bombing and machine-gun operation. The control cockpit immediately behind it contains two comfortable adjustable seats, conveniently arranged for operation of the dual engine and flight controls. Next comes the engineer's, wireless and chart room, which also contains sleeping accommodation. The whole of this compartment is well equipped with swivel chair, chart table, racks and stowage for navigation instruments, and at the aft end is mounted in switchboard fashion a set of engine instruments.

Further aft is arranged a mess room and galley, with dining table and settees, and ample stowage and locker space provided. Communicating with this compartment is an elevated platform giving rapid access to the gun ring, which is adjacent to the upper main plane trailing edge. From

there one can proceed to the tail gun, which is at the extreme end of the hull.

The biplane wings, which are of such structure and form as to require a minimum of struts, have the lower wing of considerably less size than the upper. The bottom plane is of just sufficient span to carry the all-metal wing tip floats. The upper wing has considerable overhang, and carries the only ailerons fitted, which are of the Bristol-Frise pattern. This upper wing is divided into three sections, the two outer portions being of tapered form.

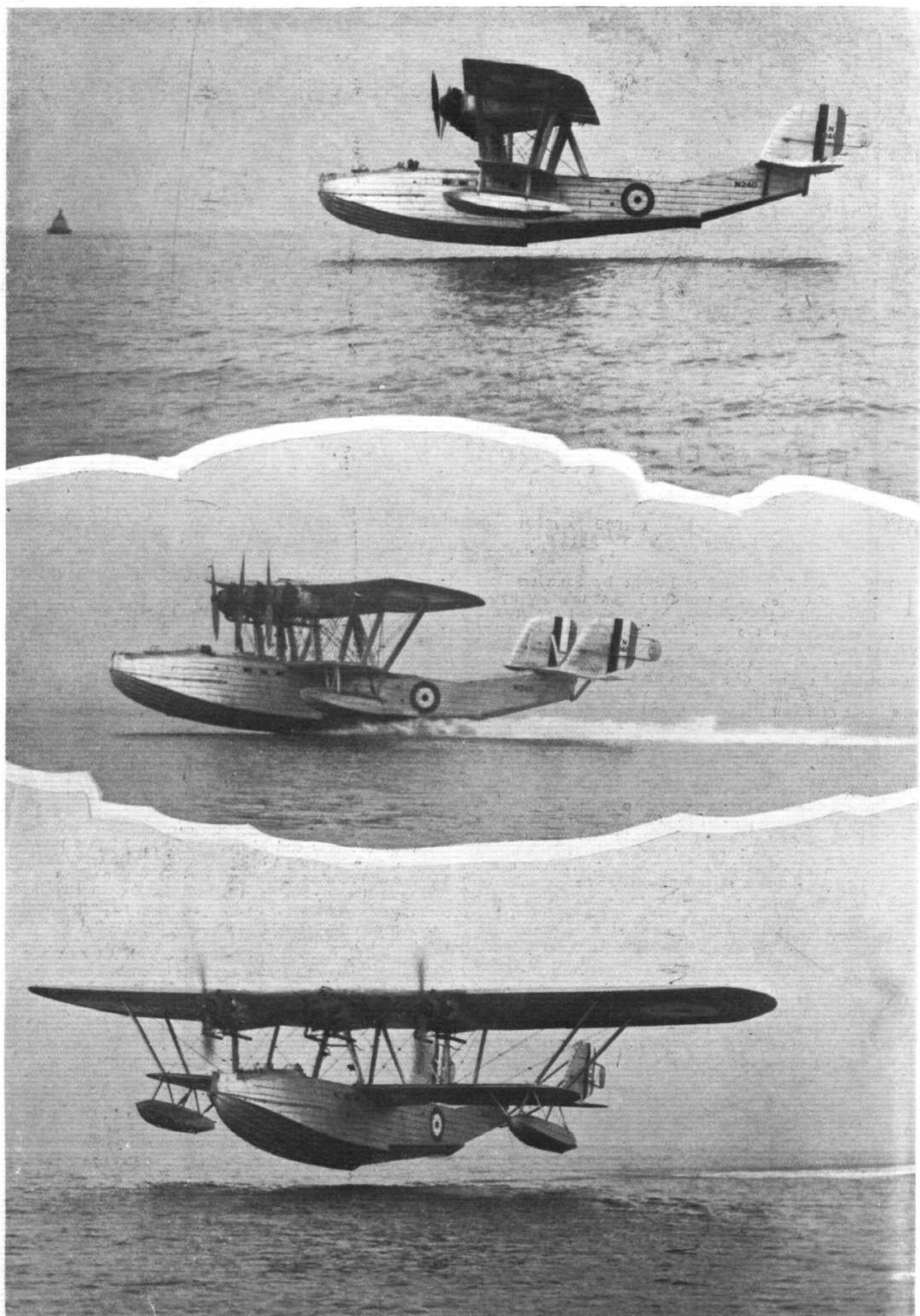
Three Bristol "Jupiter IX" engines, each developing a normal 485 h.p., are carried on the underside of the upper plane, into which they are carefully faired. The petrol tanks are carried in the upper wing, and the fuel system is of simple gravity feed, with its attendant reliability. No engine fuel or oil is carried in the hull.

A braced monoplane tailplane carrying two elevators is fitted to the rear end of hull, and two fins are mounted thereon, each carrying a balanced rudder with servo rudders. The fins and rudders are braced inwards by two struts.

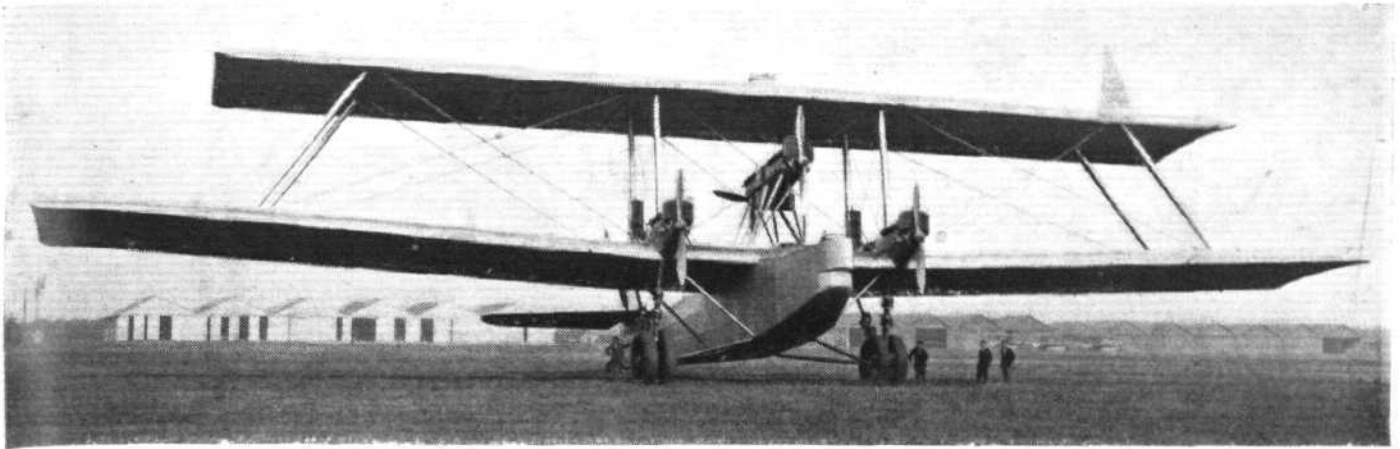
A normal accommodation is provided for a crew of five, comprising a pilot, second pilot navigator, engineer, wireless operator and gunner, and an excellent view is obtained from their various stations.

Whilst complete data regarding the Saro A.7 may not be published, it may be stated that the machine has an overall span of 88 ft., an overall length of 64½ ft., and in its fully loaded condition has a gross weight of approximately 9½ tons. Its military load is similar to that carried in the Saro "Valkyrie," of which the A.7 is an improvement in design, construction and performance.





THE SARO A.7 FLYING BOAT: Designed for open sea reconnaissance work, this machine has a metal hull of the same type of construction as that used in the Saro civil machines: Cloud, Windhover and Cutty Sark. The engines are Bristol "Jupiter IX." (Photos. by Beken & Son, Cowes.)



THE CAPRONI 90 P.B.

Italy's Giant Bomber

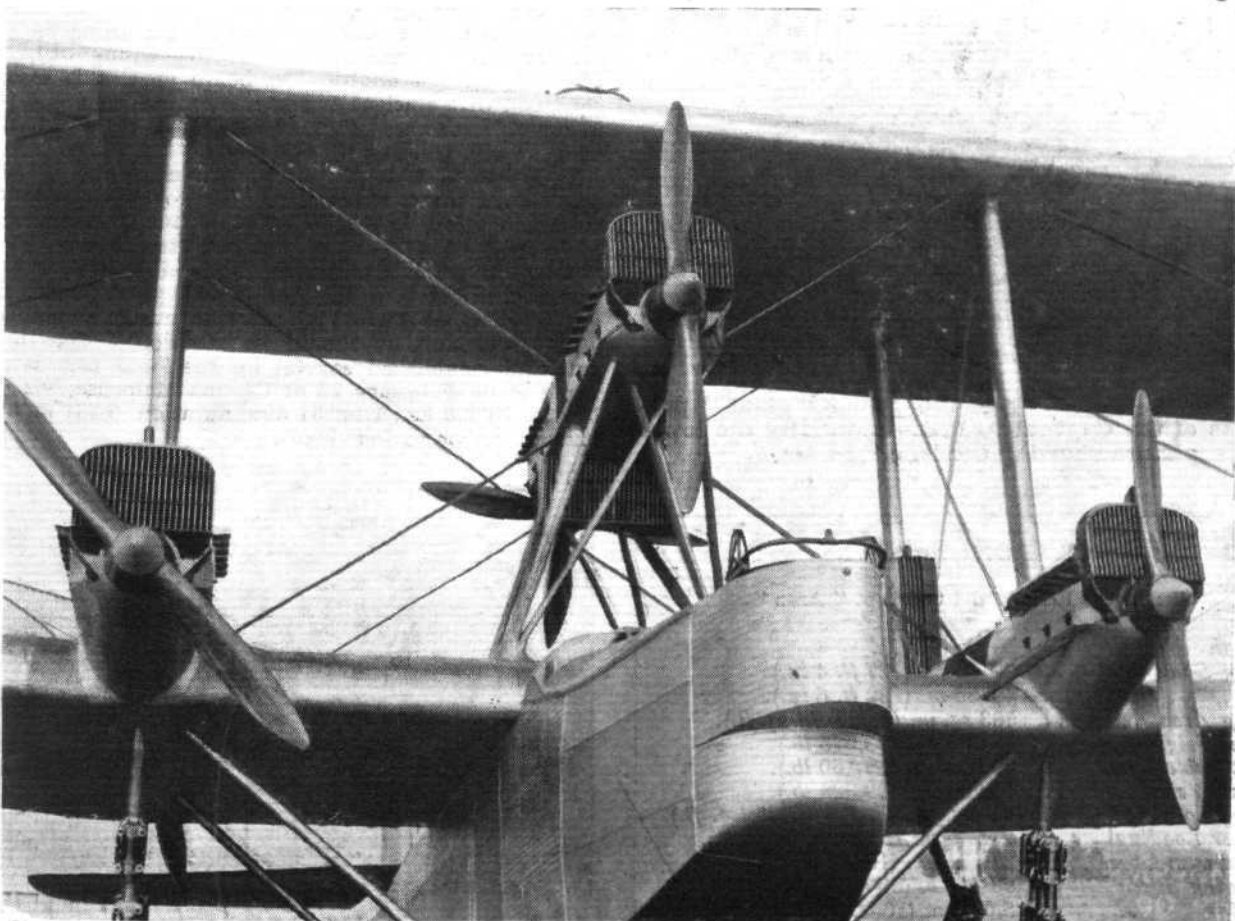
DURING the last few years Sig. Caproni, who appears to revel in what are popularly known as "giant" aircraft, economised somewhat in the dimensions of his machines—even descending from the "hundreds" to the mean proportions of the light 'plane, as in the Ca.100T, or Italian version of the "Moth." Just recently, however, this well-known Italian designer reverted to his original and early belief in the large-sized machine, and produced the Caproni 90 P.B., a few particulars of which, together with illustrations, we are able to publish this week.

The Caproni 90 P.B. is a multi-engined biplane designed for military purposes, and following typical Caproni practice—short-span upper plane and low boat-like fuselage. It has a total span of 162 ft. 6 in. (49.56 m.), and an overall height of 39 ft. 4 in. (12 m.). Owing to the fine proportions of this machine it is difficult to form an idea of its real size unless compared with some adjacent object, such as buildings

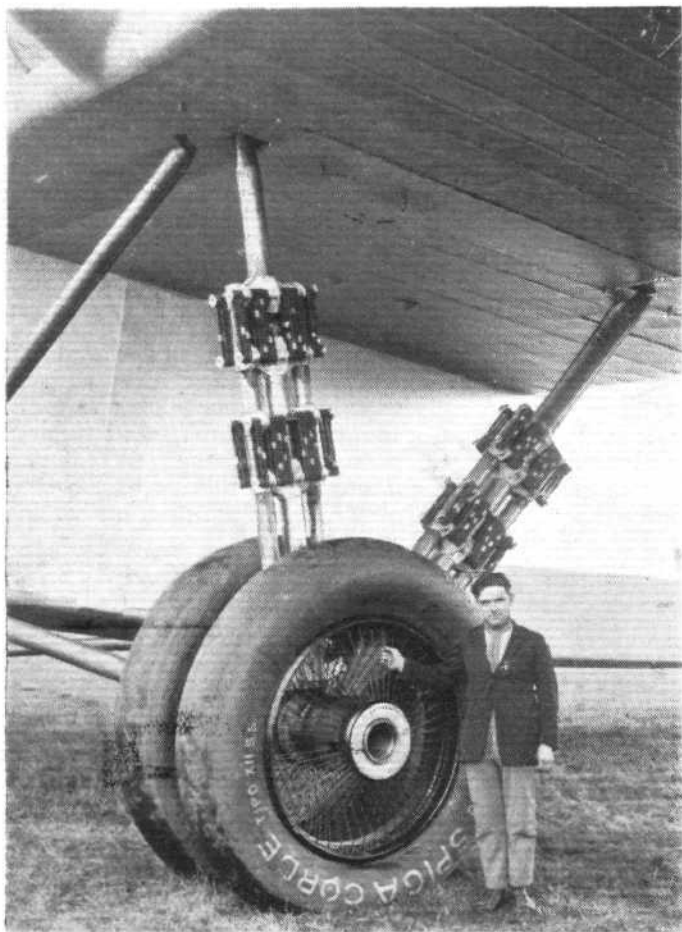
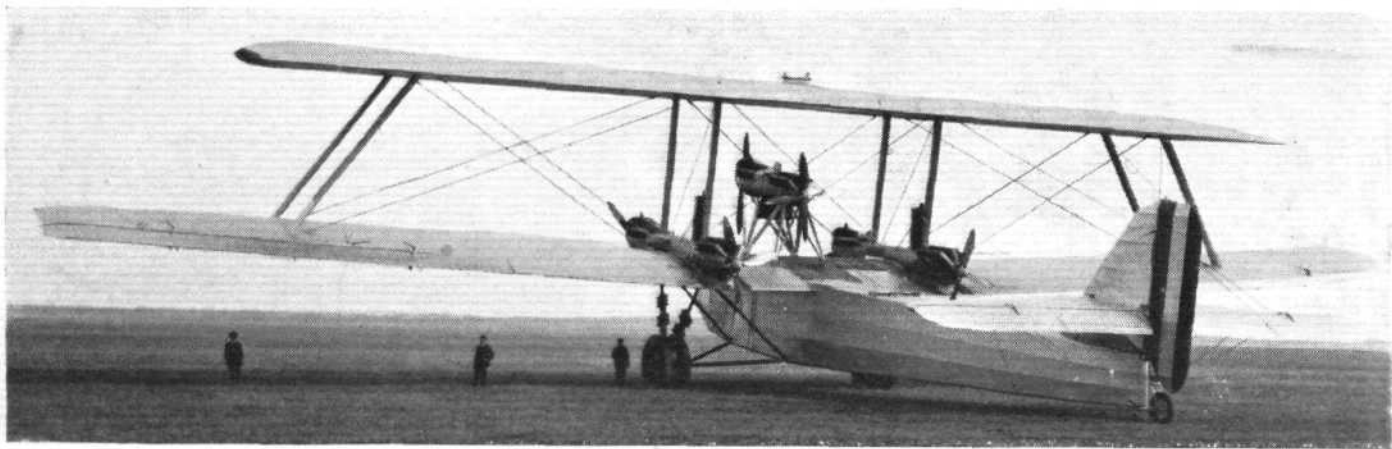
or men. This will be apparent on examining the accompanying illustrations.

The Ca.90 is constructed entirely of high-tension steel tubing, Sig. Caproni having decided that this material was preferable to light alloys (duralumin or aluminium). All joints and fittings for the steel tubing are of the socket type, and are turned entirely out of the solid. The entire structure has been carefully checked and tested for strength at the well-known laboratory of the Milan Royal Polytechnical College, and further tests were carried out in the testing laboratory adjacent to the Taliedo Works of the Caproni Co.

At the moment we have not got complete constructional details of this machine, but many of the general features may be disclosed by a careful study of the accompanying illustrations. It will be seen that the wings are of fairly thick section, the lower, and larger span, plane being mounted on the top of the fuselage and comprising a short central section to which are attached outer extensions, set at a



The upper view of the Caproni 90 P.B. shows the general lines of this huge bomber, while the arrangement of its six 1,000 h.p. Isotta engines is shown in the lower picture. Note the gun position on the top plane.



These two views illustrate the actual "giant" proportions of the Caproni 90 P.B.—especially the lower picture showing the landing wheels.

CAPRONI 90 P.B.

Six Isotta Fraschini 1,000 h.p. "Asso"

Length	..	29 m. (95 ft.).
Wing Span (top)	..	38.81 m. (127 ft. 4 in.).
" (bottom)	..	49.56 m. (162 ft. 6 in.).
Wing Area	..	563 sq. m. (6,057.78 sq. ft.).
Tare Weight	..	15,000 kg. (33,075 lb.).
Disposable Load	..	30,000 kg. (66,150 lb.).
Gross Weight	..	45,000 kg. (99,225 lb.).
Wing Loading	..	80 kg./sq. m. (16.38 lb./sq. ft.).
Power Loading	..	7.5 kg./h.p. (16.53 lb./h.p.).
Maximum Speed	..	210 k.p.h. (130.5 m.p.h.).
Landing Speed	..	90 k.p.h. (56 m.p.h.).
Ceiling	..	5,000 m. (16,405 ft.).
Normal Range	..	2,000 km. (1,243 miles).
"High-speed Figure"	$\frac{\eta}{2kD}$	= 15.1.

dihedral angle. The short upper plane is without dihedral, and is supported by two pairs of vertical struts from the lower centre section, and a pair of sloping (very much so, it will be observed) struts at each extremity.

The six engines fitted in the Ca.90 P.B. are 1,000 h.p. Isotta Fraschini "Asso" models, arranged in three groups in tandem, one group mounted centrally between the wings, above the fuselage, and the other two mounted on the lower centre section.

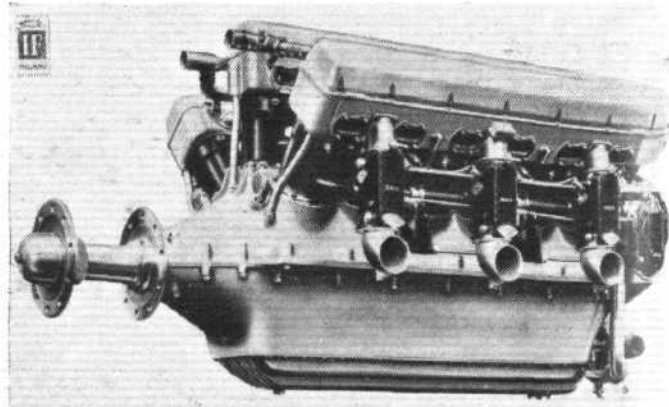
Although he fitted six engines in this machine, Sig. Caproni stated that, in his opinion, the tri-motor type of aeroplane was the best solution, and he would have installed only three in the Ca.90 had he been able to obtain suitable engines—the multiplicity of engines, he states, enormously complicates matters for the pilot who should be able to devote the maximum possible attention to the control of the machine itself.

However, the control of the Ca.90 is nevertheless stated to be exceedingly light, the Italian pilot, Domenico Antonini, who carried out the test flights, said he found the controls as light as those of much smaller machines, and stated further that he found the instruments, etc., so well arranged as to eliminate all the difficulties that might be expected on a machine of this size and with so many engines.

The Ca.90 carries a useful load of about 22 tons, using the international safety factor, or 35 tons using the German safety factor; it can carry this load over a range of 1,243 miles (2,000 km.). In addition to bomb gear, this machine is equipped with efficient armament, comprising a gun position in the extreme nose of the fuselage, another well behind the wings, and a third on the top plane.

It is stated that the Ca.90 can easily be adapted for commercial work, it being possible to provide comfortable accommodation, in a spacious cabin, for a hundred or more passengers. Furthermore, with but little increase in weight it would be possible to modify the fuselage so as to render it watertight, and thus allow of alighting and normal floating on the water, or convert the machine into an amphibian.

In conclusion, it should be mentioned that the pilot Antonini established several international records on this machine on February 22 at Cascina Malpensa, viz., with a load of 10,000 kg., 1 hr. 31 min. duration, 3,231 m. altitude, and others for various loads.



One of the six Isotta Fraschini "Asso" engines used on the Caproni 90 P.B. It has 18 cylinders and develops 1,000 h.p. at 1,700 r.p.m.; the weight, including air-screw hub is 800 kg. (1,764 lb.).

THE CURTISS "KINGBIRD"

An American Twin-Engined Cabin Transport

WE give below a brief description of the first 1930 development in aircraft design of the Curtiss-Wright Corporation—the "Kingbird," produced by the Curtiss-Robertson Airplane Mfg. Co., of St. Louis.

The Curtiss "Kingbird" has been developed as a passenger carrying aeroplane of medium size, economical in first cost and operation, but having all the advantages of the larger transports in comfort and multi-engined safety. Such a machine is exactly what is needed today for feeder lines, for sight-seeing, and for transport lines on which the traffic does not justify the use of the larger ships.

From a design standpoint, the history of the "Kingbird" really goes back to the famous "Curtis Robin," the "Robin," the new six-place "Thrush," and now the twin-engined "Kingbird," all high-wing cabin monoplanes, are similar in their general plan of construction. In developing this line of ships the Curtiss Aeroplane and Motor Company has spent over \$500,000 in engineering and research at its laboratories and experimental factory at Garden City, Long Island. This expenditure of time and money by the Curtiss engineering staff has given the "Kingbird" that degree of aerodynamic and structural quality that has always been maintained in Curtiss aeroplanes.

Briefly described, the "Kingbird" is a high-wing, externally-braced monoplane powered by two Wright Whirlwind air-cooled engines, J-6 series, mounted in outboard nacelles beneath the wings. Since there is no engine in the nose of the fuselage, vibration, noise and petrol fumes are kept away from the cabin.

Another advantage resulting from this power plant arrangement is that the pilot has unobstructed vision.

The two Wright Whirlwind engines of 225 h.p. each give the "Kingbird" an ample reserve of dependable power and a fine performance. With full load, the ship can cruise at better than 115 m.p.h., has a service ceiling of 14,700 ft., and climbs 900 ft. per minute; it can fly on either engine, thus reducing the hazard of having to make a forced landing to a minimum.

While primarily designed for passenger carrying, the "Kingbird," with a modified cabin interior, is ideal for several other types of service. Because of the reliability of its two-engined power plant, this ship is the logical one to use for photographic work, and also for mail and express carrying over regions in which a forced landing would be extremely hazardous.

The cabin has been designed to give the utmost in comfort and convenience; the pilot sits forward on the left, with the auxiliary pilot or a passenger beside him. Since the control column is of the single-wheel type, which can be passed over from one pilot to the other, it is entirely out of the way of the person occupying the right-hand front seat. To make this seat available for a passenger, it is necessary only to disconnect the auxiliary pilot's rudder pedals.

Behind the pilot's compartment are seats for six passengers, arranged in two rows with an aisle between. Further aft is a baggage compartment and a lavatory equipped with toilet and wash basin. The passengers' seats are reclining chairs, artistically upholstered in leather, with

THE CURTISS "KINGBIRD"

Two Wright "Whirlwind" J-6 Engines

Length o.a.	..	34 ft. 9 in. (10.6 m.).
Wing Span	..	54 ft. 6 in. (11.6 m.).
Height o.a.	..	10 ft. (3 m.).
Wing area	..	405 sq. ft. (37.6 sq. m.).
Tare weight	..	3,855 lb. (1,748.6 kg.).
Fuel and oil	..	690 lb. (313 kg.).
Useful load	..	2,260 lb. (1,025.1 kg.).
Pay Load	..	1,400 lb. (635 kg.).
Gross Weight	..	6,115 lb. (2,773.7 kg.).
Wing Loading	..	15.1 lb./sq. ft. (73.76 kg./sq. m.).
Power Loading	..	13.6 lb./h.p. (6.1 kg./c.v.).
Maximum Speed	..	135 m.p.h. (217 km./hr.).
Cruising Speed	..	115 m.p.h. (185 km./hr.).
Landing Speed	..	54 m.p.h. (86.8 km./hr.).
Rate of Climb	..	850 ft./min. (4 m./sec.).
Service Ceiling	..	15,500 ft. (4,724 m.).
Range (cruising, 100 gal.)	..	450 miles. (724 km.).

Everling Quantities.

"High Speed Figure"	15.8
"Distance Figure"	4.8
"Altitude Figure"	7.5



The Curtiss "Kingbird": An American 8-place twin-engined cabin monoplane, fitted with two 225 h.p. Wright "Whirlwind" engines.

high backs and luxurious box spring cushions, yet light in weight.

The cabin has unusually large windows of non-shatterable glass, which give the passengers excellent vision. The walls are upholstered in leather up to the window, and line and cloth above. Trimmings are in walnut, and a carpet covers the floor.

Ventilation and steam heating are provided. The walls are insulated against cold and noise by a special material installed between the upholstery and outer covering. The windows are fitted with sills roller shades. Drinking water is part of the equipment. In fact, everything has been done to give the passenger the atmosphere and comfort of a Pullman car.

For maximum strength with light weight, the greater part of the "Kingbird's" structure is built of aluminium alloy, heat-treated steel being used for the more heavily stressed members. The wing spans are dural tubes in the inner panels and welded steel tube trusses in the outer panels. Wing ribs are built up of dural tubes, riveted together.

The fuselage skeleton is constructed of dural tubes riveted into dural or steel fittings at the junction points. The tail surface skeletons are made up of spars and ribs stamped from sheets of alclad, the aluminium alloy material which resists corrosion.

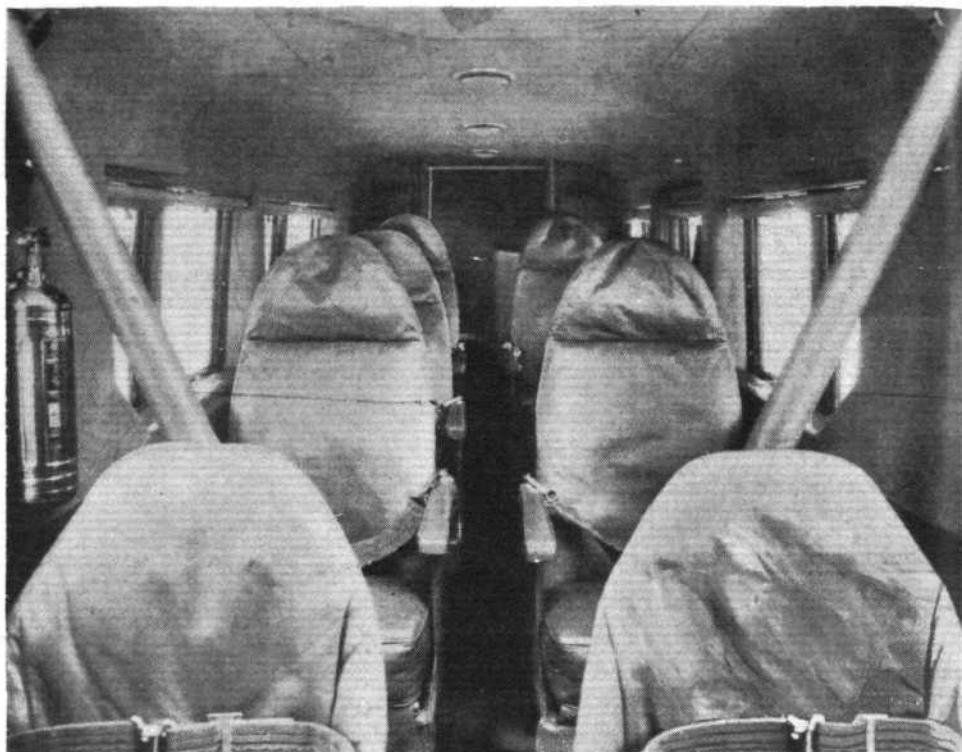
A vertical fin and rudder is placed in the slip stream of each propeller, giving directional stability and control under all conditions.

The landing gear is designed to give very smooth landing and taxiing characteristics. A rubber-tyred tail wheel is provided, and powerful oleo-and-spring shock absorbers are installed both on the main landing gear and on the tail wheel. Bendix brakes are used.

The wings, fuselage and tail surfaces are covered with highest quality fabric. The engine nacelles are covered with removable dural cowling, giving easy accessibility to all parts of the power plant installation.

As in the case with all Curtiss ships, the strength of every detail of the structure has been most carefully checked by stress analysis supplemented by static tests.

The "Kingbird" is completely equipped for night flying, having landing lights retractable into the fuselage cowling,

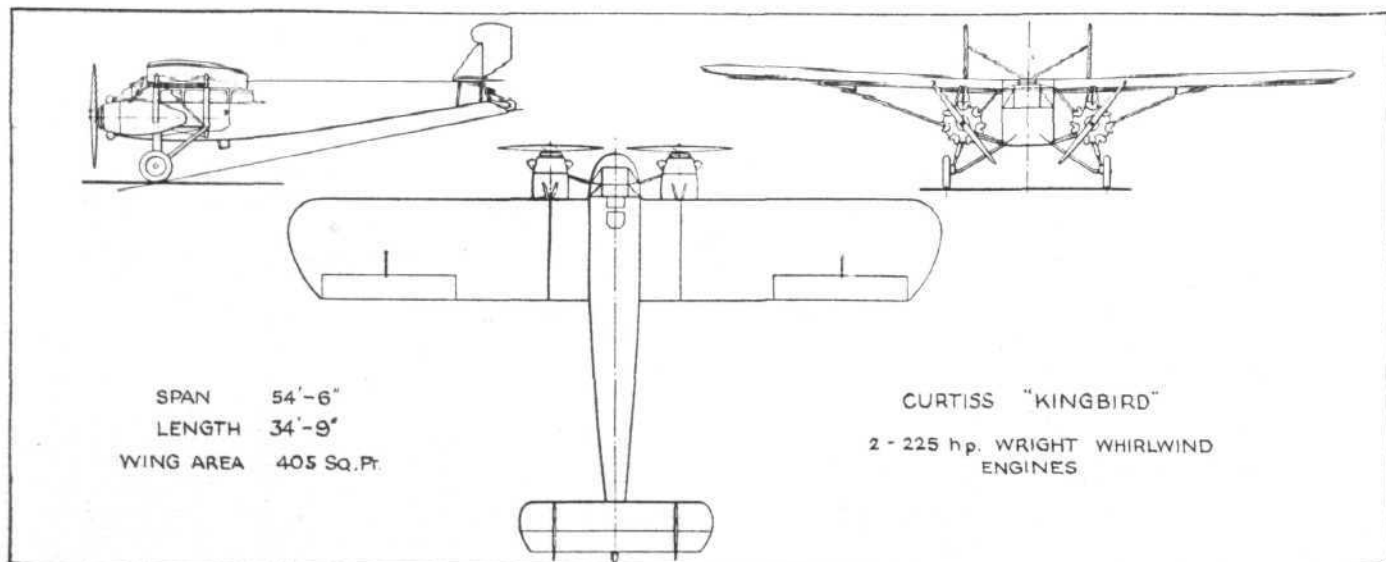


An internal view of the cabin of the Curtiss "Kingbird." There are six comfortably-upholstered chairs, three a side with a gangway in between.

navigating lights, instrument board lights and dome lights in the cabin. The comfortable reclining chairs protect the passengers against fatigue on this type of service.

The important control system has been given most careful consideration. A side-by-side dual system is used, the rudders being actuated by pedals and the ailerons and elevators by a single flop-type wheel, which is always entirely clear of the front seat not being used by the pilot at the controls. The elevators are worked by push-rods, the rudders by cables, and the ailerons by cables running up to the wings and connecting there with push-rods. The ailerons and rudders are balanced aerodynamically so as to give light loads on the controls.

We understand that the "Kingbird" can be fitted with the Wright J-6 nine-cylinder engines (375 h.p.), with a resulting increased performance. For instance, the maximum speed is increased to 160 m.p.h. and the climb to 1,600 ft. per minute. The service ceiling in this case is 21,000 ft. and the absolute ceiling 22,500 ft.



THE CURTISS "KINGBIRD": General arrangement drawings to scale.





PRIVATE FLYING AND CLUB NEWS



DE HAVILLAND Aircraft Co., Ltd., having recently enlarged their facilities for private owners at Stag Lane Aerodrome, now have a few vacant lock-ups for the housing of Moths and Puss Moths. This accommodation, with attentive service, is available immediately.

CINQUE Ports Flying Club.—Fog stopped flying on both Mondays, December 15 and 22, and on Friday, December 19. Sunday, the 14th, would have been a good day, but S. A.'s carburettor chose to go out of action, and had to be changed. During the nine days ending December 22 members got in a total of 21 hr. 40 min., made up as follows:—Dual (6 members), 5 hr. 30 min.; advanced dual, 15 min.; solo, "A" pilots, etc., 13 hr.; tests, etc., 2 hr. 25 min.

The Club was glad to welcome back Mr. d'Ydewalle, who qualified with the Club last June. Mr. d'Ydewalle is an officer in the South Staffordshire Regiment, and has done a great deal of flying during the autumn in the North of England. The Club closed down on December 22 and reopened on December 31. During 1930 the club aircraft have made some 3,204 flights totalling 1,252 hr 55 min. June was the best month with 177 hr. F./O. Fox Barrett of No. 25 (Fighter) Squadron very kindly acted as Instructor at times when Mr. K. K. Brown was away and between them these two have trained 37 members for their "A" licences, 24 of whom had had no previous experience at all. On December 31 there were 145 members, of whom 120 were flying members, of these latter 58 held "A" licences; 2, "B" licences and 28 own and fly their own aircraft. During the whole of the year there were only three accidents. The first resulted in complete destruction to the aircraft, but only slight injuries to the occupants; the other two were merely trivial damage to the aircraft and no damage to the occupants.

THE HAMPSHIRE Aeroplane Club has had a very good and prosperous year, earning the full amount of the subsidy. Their total number of flying hours for 1930 was 2,362, which is an increase of 600 over the previous year. Forty-one members obtained their "A" licences against 37 in 1929. The club aircraft were replaced as they became obsolete and the fleet now consists of four Moths and one Avian. An interesting innovation has been the institution of a periodical landing competition which proved very successful, so much so that it will be continued during the ensuing year. During the winter months an instructor is taking a machine to Basingstoke, once a week and giving dual instruction and joy rides, and schemes are on foot for similar activities to be undertaken in other parts of Hampshire. As has already been reported in *FLIGHT*, the fifth Annual Dinner and Dance was held early in December, and it proved to be by far the most successful of the series. On March 1 last, Mr. H. A. Marsh joined the staff as Assistant Instructor to Mr. Dudley, and the considerable increase in the number of flying hours is in no small measure due to the keen way in which he has tackled his job. The club house has also been greatly improved by the addition of electric light and many other small details. Those interested in the club should note that a Dance is being held at the Pavilion, Bournemouth, on Wednesday, January 28, tickets for which are 3s. 6d. each and may be obtained from the Secretary. The membership of the Club at present stands well over 400.

ON PILOTS' LICENCES.—In *FLIGHT* for December 5 we reprinted the first part of an article on the above subject by Mr. Alan Goodfellow from *The Elevator*. This is now concluded, and we are glad to see that he holds to our opinion

that while rules are definitely very necessary and that the existing ones require rationalisation, it is, at the same time, essential that the whole subject should be reviewed at an early date and the number of rules kept down to the absolute minimum. On the matter of pilots' licences, it would seem that more good could be done by a few simple rules strictly carried out and adhered to in the same sort of spirit as our contributor "Daedalus" advocated in his article on December 19, and was endorsed in our correspondence column by Sandy McTavish last week.

Last month we dealt in some detail with the existing "A" Licence tests and with proposals for their improvement. It is not the writer's intention to deal with the "B" Licence tests in the same detail, partly because detailed criticism of

the tests by a pilot who went through them appeared in *The Elevator* a short while ago, and partly also because it is not really for an amateur pilot such as the writer to suggest tests for a commercial pilot's licence. It is not out of place, however, to discuss whether, without laying down the actual tests to be imposed, the form and validity of the existing "B" licence (leaving out of question for the moment the Master Pilot's licence) might not be altered. The point is that there are so many different types of commercial flying, involving such different degrees of experience and skill, that the licence in its present form is lacking in elasticity. It ought to be made as easy as is consistent with the safety of the public for a pilot to get into commercial flying, while, on the other hand, the young pilot should start at the bottom and should be restricted to types of flying in which his lack of experience is unlikely to lead to serious consequences. Roughly speaking, the idea would be that as soon as a pilot could satisfy his examiners that he was competent to be trusted with any normal single-engined aircraft under reasonable conditions he should be granted his "B" licence and allowed to enter commercial aviation. His original licence, however, would only permit him, for example, to fly single-engined machines of not more than three-seater capacity within the boundaries of Great Britain. As he grew more experienced he would pass further examinations which would qualify him for employment in other types of work, such as (a) piloting multi-engined aircraft, (b) flying instructor, and so forth. His additional qualifications would be added by endorsement to his licence as and when he passed each examination. This idea seems sounder than the present licence, which (subject to his obtaining a second-class navigator's certificate for certain types of work) entitles him to take on any form of commercial flying, but only as pilot of the makes of aircraft specifically endorsed on his licence. The idea is similar to that already in force in America, but would be a considerable extension of the same.

It is fairly obvious that these suggestions could not be satisfactorily carried into effect without the existence of one or more recognised training centres for civil pilots, where the advanced training could be carried out. There is reason to hope, however, that such centres may be established before long. It is common knowledge that one of our biggest aircraft combines have one under consideration, and that, in addition, the establishment of an Imperial School of Air Pilotage is being discussed by representative bodies.

There are two additional aspects from which the tests in general may be impartially, and therefore usefully, considered. Firstly, there is the question of how the tests should be passed and who should be the examining authority.



ENCOURAGEMENT: This magnificent Cup has recently been presented by Cirrus Aero Engines, Ltd., to the New South Wales Aero Club, for annual competition.

Secondly, there is the wider question of whether tests for "B" or "A" licences are really necessary at all.

On the first of these points a good deal of criticism has been levelled, and justifiably levelled, against the Air Ministry. The present regulations necessitate the technical and medical examinations being taken in London, while the flying tests are done at three separate aerodromes in the South of England—or were, at any rate, in the case referred to above. Obviously, such an arrangement involves very great inconvenience and expense to a provincial candidate. If the Air Ministry is to be the examining authority, it is essential that travelling boards or provincial examination centres should be created, as is the practice for ground engineers' licences.

Here, however, it is well to consider whether the Air Ministry should in future be the examining authority at all, or whether that task might not very well be handed over in the near future to the Guild of Air Pilots and Air Navigators as representative body. The Guild already counts in its membership most of the experienced professional pilots and navigators of our country. One would like to see a joint committee of the Air Ministry and the Guild set up to consider and revise the "B" licence tests. Thereafter (unless there are any international considerations to prevent it) one would like to see the Guild take over the position of examining authority (receiving the proper fees for the same) with the Air Ministry as the controlling authority, to whom every pilot would have a right of appeal in suitable cases. Other honourable professions and callings afford ample precedent for such a procedure, and the sooner the step is taken the better.

Who should conduct the medical tests is another matter, for the members of the medical board, by reason of their accumulated experience, are exceptionally fitted for this work. Much depends upon whether the present stringent medical tests are to be maintained. Normal flying in good weather involves far less physical and mental strain than driving a car. Certain types of flying on the other hand, such as long distance or high altitude work, may impose heavy physical strains, while blind flying for example may impose heavy nervous strains. As the air line pilot cannot pick his route or weather, he must be fit to withstand all such strains, though the same does not necessarily hold good in all types of commercial flying. The grading of pilots as fit for certain types of flying might be standardised perhaps, if it is thought necessary to retain the present system indefinitely. On the whole, however, the Air Ministry is at present the best body to determine what medical tests shall be applied.

In urging that the Guild should be entrusted with examining authority the writer does not overlook the somewhat curious criticism levelled against it recently by *The Aeroplane* which was afraid that the Guild was becoming "a trades union, rather than a body of gentlemen adventurers"! Presumably the Guild is, and will very properly be, a trades union in the same sense that the Bar Council or the British Medical Association are Trades Unions, but there is nothing derogatory in that. The Guild is vitally concerned with the rights, status and reputation of commercial pilots and navigators of British nationality. Hence the recommendations in this article, but it follows from what has just been stated that the Guild is *not* the proper authority, even in a consultative capacity, on "A" licence tests or, to be more

accurate, on amateur and sporting flying. The proper body here is the Royal Aero Club, with the General Council of Light Aeroplane Clubs. The relative positions of the R. Ae. C. and the G.A.P.A.N. are a matter of some importance, and may become increasingly so. They will be made the subject of a separate article next month.

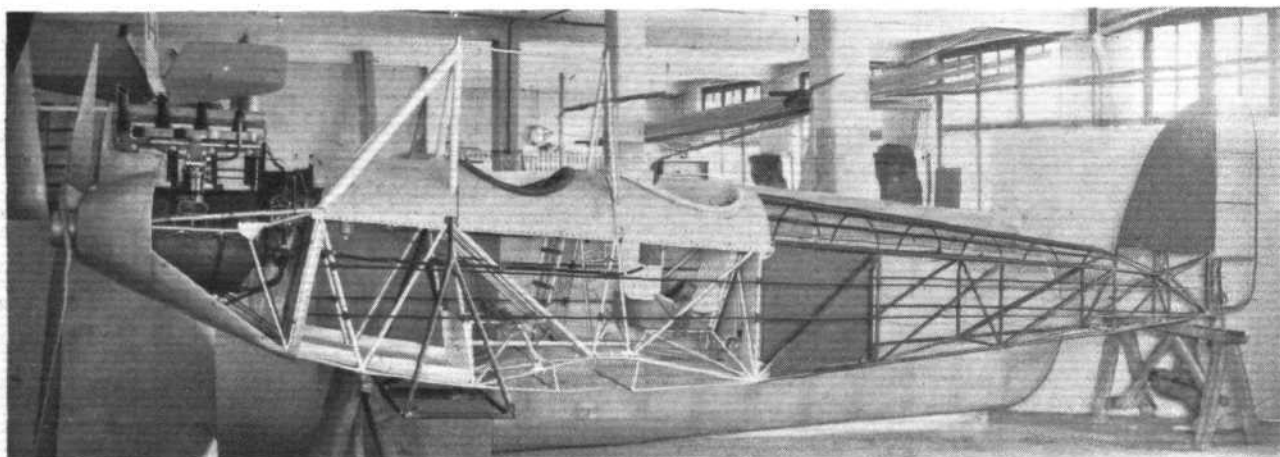
Proposals have now been laid down for the revision and improvement of both "A" and "B" licence tests. *The Elevator* (or *FLIGHT*—Ed.), alone cannot force these proposals to an issue, but as it is read by members of all the three bodies above referred to, it may possibly be the means of bringing the various points up for discussion and decision.

There is one other matter which must be considered, and that is the necessity or otherwise for any licence tests at all. The answer to this question depends on the future status of the air pilot. Is he, as some think, going to rank with the taxi-driver, or is he to go to the other extreme, going to be "a gentleman adventurer"? Personally one believes that he will be neither, but that the commercial pilot will have a status similar to that of a Mercantile Marine Officer, while the private owner's position will be akin to that of the private yacht owner. Surely it cannot be otherwise, for the sea and the air are both elemental things, the fight with which tends to produce essentially the same type of man in the long run. Indeed, the Guild itself has probably recognised this fact in modelling its constitution upon that of the master mariners.

If this view is correct, there can be no doubt that examinations for commercial pilots should remain. Furthermore, through the I.C.A.N., or other appropriate body, commercial pilots' licences should be made valid internationally, while appropriate steps should be taken to ensure that a British "B" licence and Master Pilot's licence shall both enjoy the highest international repute.

As regards amateur pilots it might be argued by analogy that no tests should be required, since no tests are required of the amateur yachtsman. The analogy, however, is false in this respect—that the perils of collision in the air are on the increase and that the consequences are more certainly disastrous by air than by sea, when a small yacht is unlikely to sink a large passenger vessel. Tests alone would not obviate the danger, but a licence or F.A.I. certificate could and does render amateur pilots liable to a salutary discipline exercised by people with a knowledge of aviation, as distinct from lay magistrates with no such knowledge.

To sum up, tests and licences are desirable in both cases. The details should, if possible, be agreed internationally in consultation with the representative national bodies concerned, and such bodies should subsequently act as examining authorities with the Air Ministry as controlling and appeal authority. Since Government control however, nearly always means a multiplicity of regulations, it should be limited to the minimum necessary to ensure that the powers and duties entrusted to the representative bodies are not in any way abused. If matters could be settled on these lines the risk of petty and unnecessary restrictions would be largely avoided and such restrictions and discipline as were imposed would be administered by those to whom the rights and prestige of British pilots are of paramount importance. There is no reason to fear that under such conditions the international repute of British pilots and navigators would not rank as high as that of British seamanship.



A GIPSY FLIGHT: As reported in "FLIGHT" December 12, Mr. J. E. Van Tyen, a member of the well-known firm of Van Houten, recently flew from Holland to the Dutch East Indies in a Pander. The view above shows this machine during construction.



GLIDING



THE PORTSMOUTH and Southsea Gliding Club has now ended its first year of work. Seventeen "A" licences have been obtained and many more members are ready to pass their tests on the first available opportunity. Portsdown Hill above Wymering, is, of course, only suitable when the wind is in certain southerly directions and the club is therefore greatly indebted to Capt. Else who has allowed them to use Windmill Hill, and thereby enable them to glide when the wind is from the north. The club's policy has always been one of "slowness and surety" and the number of "A" licences gained would appear to have thoroughly justified this policy.

WEATHER was particularly unfavourable for the three-day gliding meeting which had been arranged at Flixton at the end of last month by the Northern Gliding Clubs. Both snow and rain provided adverse conditions. Inter-club contests had, therefore, to be abandoned. At one time, however, a south-westerly wind made the use of a neighbouring site, Scalby Nab, feasible, and from here Herr Groenhoff was able to soar in the Scarborough Club's two-seater machine. Herr Groenhoff is the test pilot from the German Gliding School at the Wasserkuppe and is taking the place of Herr Mageruppe while the latter is on holiday. It is hoped to hold the inter-club competitions, for which many trophies and prizes have been given, at a later date.

A NEW Gliding Club has been formed by the employees of the Bradford City Tramways. The membership is already over 40 and Mr. Marchbank, an ex-R.A.F. pilot and now Cashier at the Tramway Central Office, will be the Instructor.

SOUTH AFRICAN Gliding clubs have decided that amalgamation will be the best way of overcoming many of their difficulties, and the Western Province Gliding Club is, therefore, joining forces with the Capetown Flying Club.

LONDON GLIDING CLUB.—A new system has been instituted which will differentiate between pilots and beginners, whereby when there are sufficient of each type, two machines will be operated, one for an instructional group and one for an advanced group. The latter will be composed of all those who hold "A," "B" or "C" licences. In the event of an insufficient number turning out to operate the two machines, the two groups will take priority on alternate Sundays, starting with an instructional group on Sunday, January 11, and an advanced group on the following Sunday,

and so on. The lecture which had been arranged on Wednesday, January 28, by Mr. C. H. Lowe-Wylde has been unavoidably postponed. On January 29 there will be a lecture before the Royal Aeronautical Society at the Royal Society of Arts, 18, John Street, Adelphi, at 6.30 p.m., by Herr Lippisch, on the "Development and Construction of Sailplanes and Gliders." Herr Lippisch is the designer of Herr Kronfeld's "Wien," the "Fafnir" and many other well-known gliders and his lecture should be of the greatest value to all those interested in gliding.

THE SAILPLANE CLUB.—During the past two week-ends the club's activities have been directed to the erection of their new hangar. A large amount of interesting data has now been gathered as to the size and position of the various air currents round the gliding site at Smalldole, by means of tests with models, which Mr. John Welding has been carrying out. Flights of great length have been attained, and he hoped in time to be able to chart the whole of the country round their gliding site.

THE ASSOCIATION of Northern Gliding Clubs.—The weather during the Christmas holidays has, generally speaking, been too bad for gliding, but on January 4 the Ilkley, Harrogate and Leeds clubs were able to put in a considerable amount of work on The Aircraft Clubs' ground, a fairly strong northerly breeze making flights of two minutes' duration possible. The machines in use were a Reynard, a Zögling and a Dickson. The latter was built by the Aircraft Club, Harrogate, to FLIGHT drawings, and it is interesting to note that its performance has made it one of the most popular machines of its type, even in winds of up to 30 m.p.h.

THE INTERNATIONAL Commission for Studies in Motorless Flight which was founded in Frankfurt last June, recently held its first meeting in Paris with Professor Georgiu as chairman. It was decided that international glider competitions should be held annually from 1932 in one of the countries represented on the Commission which are at the moment, Germany, England and France. Four sub-committees were formed; a Scientific Committee under Professor Magaun, of the Collège de France; a Technical Committee under Professor Hoff, Director of the German Experimental Institute for aeronautics; a Sports Committee under Mr. Gordon England, of the British Gliding Association, and a Propaganda Committee under M. Wolff, of the Belgian Aero Club.



LIKE THE REAL THING: A photograph of the diorama of Croydon aerodrome exhibited by Anglo-American Oil Co. at the recent Motor Show. The extraordinary excellence of this piece of work is too obvious to need comment.

THE FLIGHT CONDITIONS OF GLIDERS

By L. HOWARD FLANDERS

THE actual flying conditions of gliders, whether of the primary training type or the high-efficiency sail-plane, are rather difficult to arrive at. The glider is gliding down at some angle to a rising current of air. The angle of the rising air current to the horizon is unknown, and its actual speed is also unknown, even though the average velocity of the undisturbed wind may have been measured. The problem is made even more confusing by the fact that the glider may be actually gaining altitude while gliding down the air current.

The stresses in the spars of gliders may or may not be considered heavy. It depends on the assumptions made as to the actual conditions of flight. The C.P. forward conditions are fairly easy to visualise, and the load factor of 6, laid down by the British Gliding Association and the Rhön Rossitten Gesellschaft, does not call for much criticism. On the other hand, the C.P. back condition is ambiguous. What is "the top speed at ground level"? (A.P. 970). Using the formula for single-engined aircraft, and taking "N", the horsepower per 1,000 lbs as zero, the top speed works out very close to the stalling speed. There is no justification for the assumption that the horse-power due to gravity is zero, but as it has not passed a type test of 100 hours on the bench, it is not to be found in Air Ministry publications! (The horse-power of a glider is shown in Table I.)

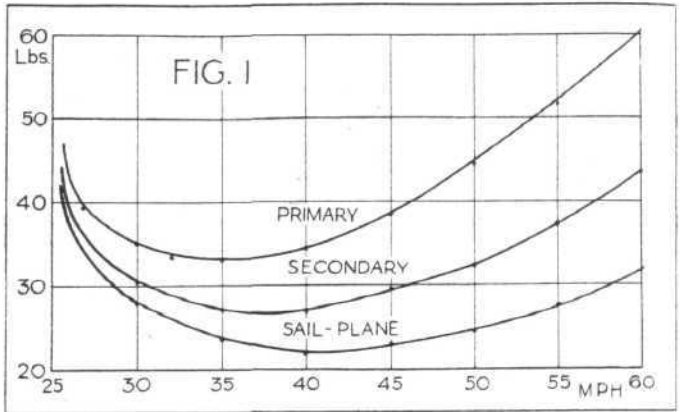
It is obvious that if we take "P" as the component of the force of gravity in the line of the true flight path of the glider, we have a force which is more readily expressed in lbs. than in horse-power, and moreover "P" must equal "R," the total resistance of the glider, for if not, there would be an acceleration, and the speed of the glider would be changed until the forces were in equilibrium.

One of the difficulties of the task of determining the conditions of the flight of a glider is that these conditions are continually changing from second to second. Consequently, for the purpose of this article the instantaneous condition of equilibrium of the forces on the glider is assumed to be constant for each five miles per hour of air speed from the stall to the nose dive.

The other assumptions are:—a family of three gliders has been taken with the same wings, the same loaded weight, but three different fuselages. The head resistance of the fuselage, struts, wires, pilot, (i.e., the parasitic resistance)

as well as the tail plane and elevator drag have been taken as a constant multiplied by " V^2 " and the whole resistance considered as a flat plate normal to the line of flight having an area, for the primary type, $3\frac{1}{2}$ sq. ft., for the secondary type, 2 sq. ft., and for the sail-plane 1 sq. ft.

The wing section is Göttingen 549, which is used on the "Wien" the "Elieida," the "Hercules," the "Professor," the "Prüfling" and doubtless many other gliders. Fig. 1 gives the performance curves of the three gliders, which show gliding angles of approximately 10° , $12\frac{1}{2}^\circ$, and $15\frac{1}{2}^\circ$ respectively. The sail-plane gliding angle of $15\frac{1}{2}^\circ$ appears to be low, but no attempt has been made to correct for high aspect ratio or



washout. The advantage gained by such modification of the wings is almost entirely confined to large angles of incidence. Since the investigation is chiefly in the region of negative angles, it appeared more convenient, and equally correct, to use exactly the same wings, having an aspect ratio of 6, in each case. The loading is assumed at 2.2 lb. per sq. ft., which is an average value for the various types. The gliders weigh 340 lb., including pilot, and have a wing area of 155 sq. ft. The accuracy of working is to the ordinary limits of a 10-in. slide rule and Trig. Tables to each 10 minutes of arc only. The units employed are lb., ft., and miles per hour.

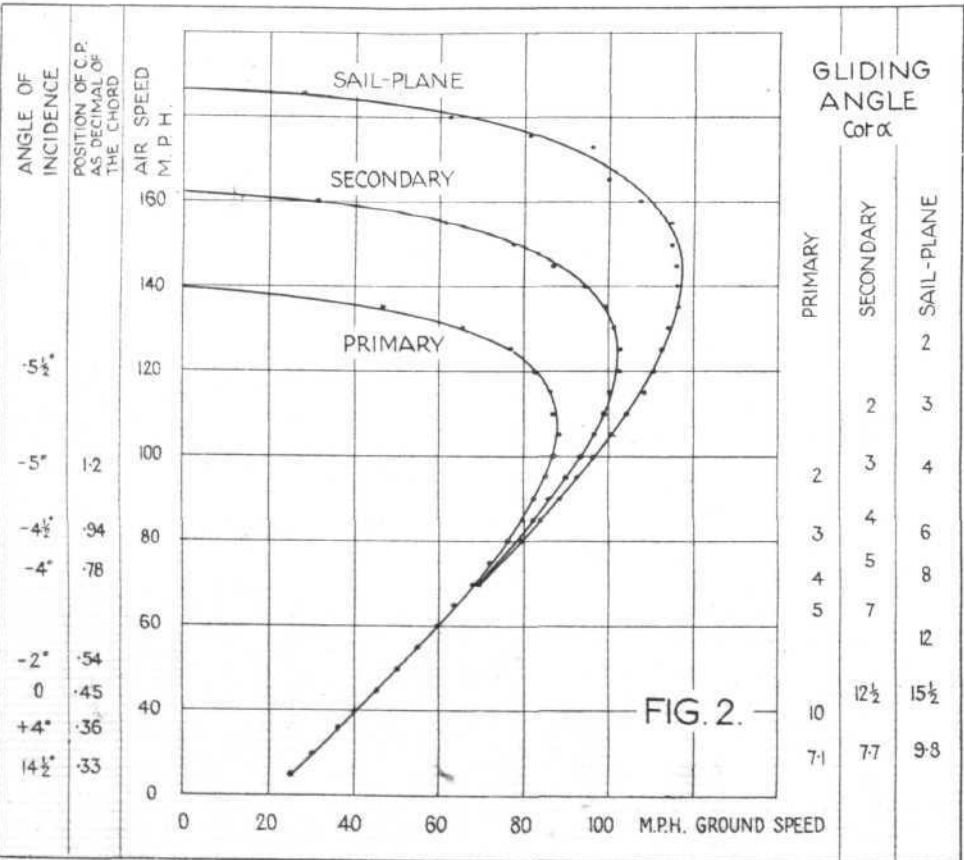
A table was made out for the following variables:—Air speed—Resistance—The angle of the flight path to the horizontal (this was found by equating $W \sin \alpha$ to the resistance)—The horizontal velocity (this is the air speed multiplied by $\cos \alpha$).

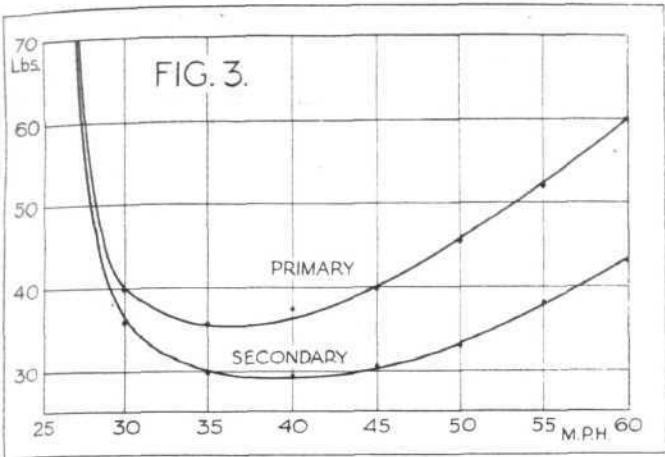
The maximum horizontal speed is the maximum wind speed in which the glider could be flown without being blown backwards.

The two variables, air speed and horizontal velocity, are plotted in Fig. 2, from which it may be seen that the speed of gliders is somewhat higher than is frequently supposed, the terminal horizontal velocity of the three types being 88, 102, and 117 m.p.h. respectively. It will be noted that the air speed, when flying in high winds, approaches that of the nose-dive case.

The angle of incidence, the position of the C.P. as a decimal of the chord, and the gliding angle at the various speeds are also indicated on Fig. 2. From this it will be observed that fine angles of incidence and backward positions of the C.P. are the rule with the more efficient types of gliders.

Some gliding clubs have grounds with a fairly steep slope, and occasionally a glider pilot will glide down following the slope in the ground. If the slope is only 1 in 3





(Itford Hill is about 1 in 1 at the more moderate slopes facing north) a primary type glider would attain an air speed of 80 m.p.h., the angle of incidence would be minus $4\frac{1}{2}$ degrees, and the C.P. at 0.94 chord. With the secondary and sail-plane types, the speeds would be 95 and 110 m.p.h. respectively, with the C.P. behind the trailing edge of the wing.

It may be argued that such flying is not good gliding because the high rate of descent precludes any chance of making a good time, nevertheless it is done sometimes, occasionally by good power aircraft pilots. Moreover, if there is a stiff wind, the upward current of air may make the speed appear to be very moderate. If it is done at all then, there should be a load factor of at least 2.

If the assumptions of this curve are correct and the curve does, as it appears to do, represent the true relationship of the variables connected with the flight of gliders, then it is an envelope curve, i.e., it is impossible for the glider to fly at any position which does not lie on the curve, with two exceptions, one below the stall, two when zooming. However, the k.e. of a glider is very low compared with the resistance; consequently the ability to zoom and force the glider from its place on the curve is small, and the departure will be momentary.

If the curve is plotted in three dimensions, then the load factors can be included on the same curve. It would appear to the writer that if Göttingen 549 is used for gliders, then the C.P. back factor should be at least two, with the C.P. at the trailing edge. Such a factor will necessitate a very heavy rear spar. There is much to be said for the tailless glider, though with this there may be considerable torque on the wings.

It seemed desirable to see how these envelope curves would represent a glider with a totally different type of wing. A low-lift wing, with stationary C.P. and large area to give the same stalling speed, because as this is as diametrically opposite a case as can be found, it would test the envelope curve for gliders. Göttingen 445 (N.A.C.A. 797) was chosen, with a wing area of 260 sq. ft. This is a symmetrical double-camber of the type used for very high-speed power aircraft, and has a reverse C.P. movement of 0.35 to 0.22 only. The large area and thin wing would necessitate a biplane structure. Fig 3 shows the performance curves, which indicate a small speed

range at useful gliding angles and a very marked stall which would tend to cause many crashes if used for training purposes. Fig. 4 is the envelope curve for two gliders with these wings. It will be noticed that the curves are of exactly the same form as in Fig. 2, but the high speeds are somewhat increased, the gliding angle is reduced, and the position of the C.P. is such that the C.P. forward and C.P. back positions may be considered as the same, so that a load factor of 6 for the slow speed angles will cover all cases.

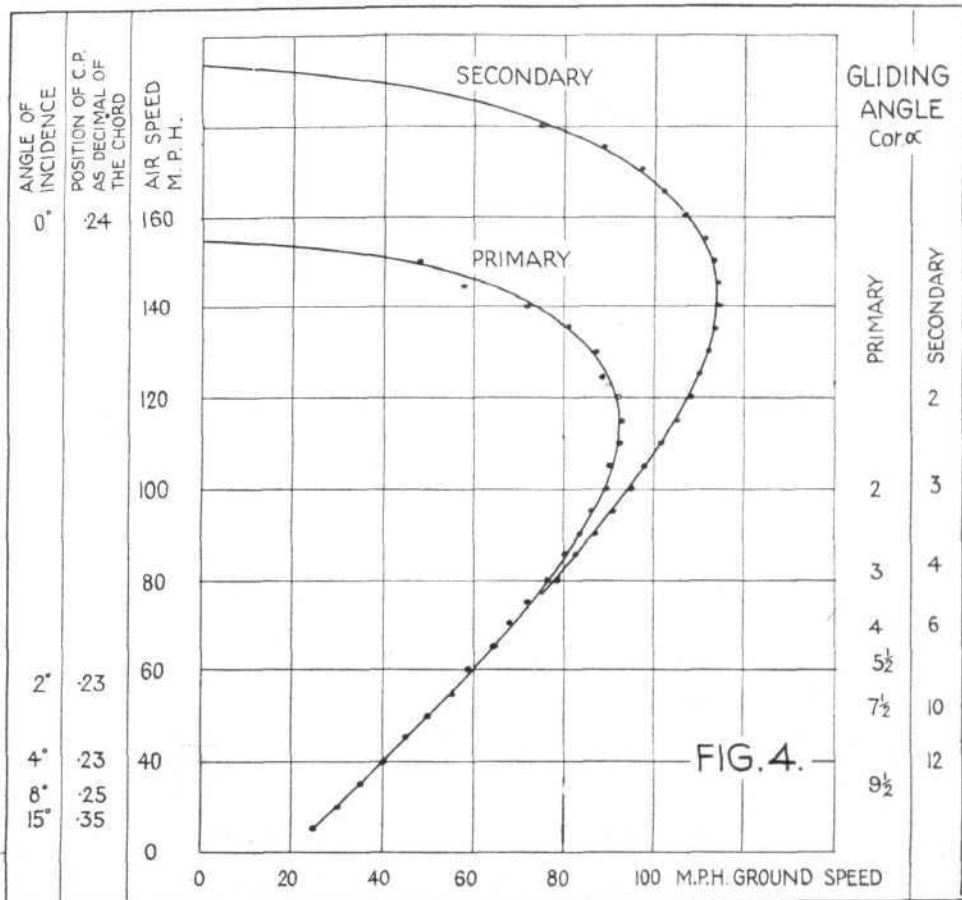
A similar set of curves was drawn for a family of gliders loaded 2 lb. per sq. ft. with U.S.A. 27-wing section. The curves are very similar to Fig. 2. In fact, if the stalling speed of 22 m.p.h. is brought to coincide with $25\frac{1}{2}$ m.p.h., the primary and secondary types coincide, but as the wing is more efficient the sail plane shows a higher speed. The C.P. position is no worse than for the Göttingen 549, and as it is possible to use a larger rear spar, the use of this wing section might result in a safer machine.

It has already been noted that the extreme range of wing section as illustrated in Figs. 2 and 4 are similar except for angles of incidence and positions of the C.P. Hence it would appear that the glider is less changed by variations in the aerodynamic characteristics of the wings (provided suitable areas are used) than power-driven aircraft. Doubtless this is due to the fact that gravity is an excellent and elastic motor. Table I shows the net horse-power provided by gravity at different air speeds for the three gliders represented in Figs 1 and 2. For the benefit of gliding readers who may be tempted to put an engine in a glider and are not familiar with power aircraft, it must be noted that the horse-power given is net. About 30 per cent. more power must be supplied for airscrew losses, and the added resistance of the engine and airscrew would reduce the performance of the sail-plane to that of the primary type unless very well streamlined.

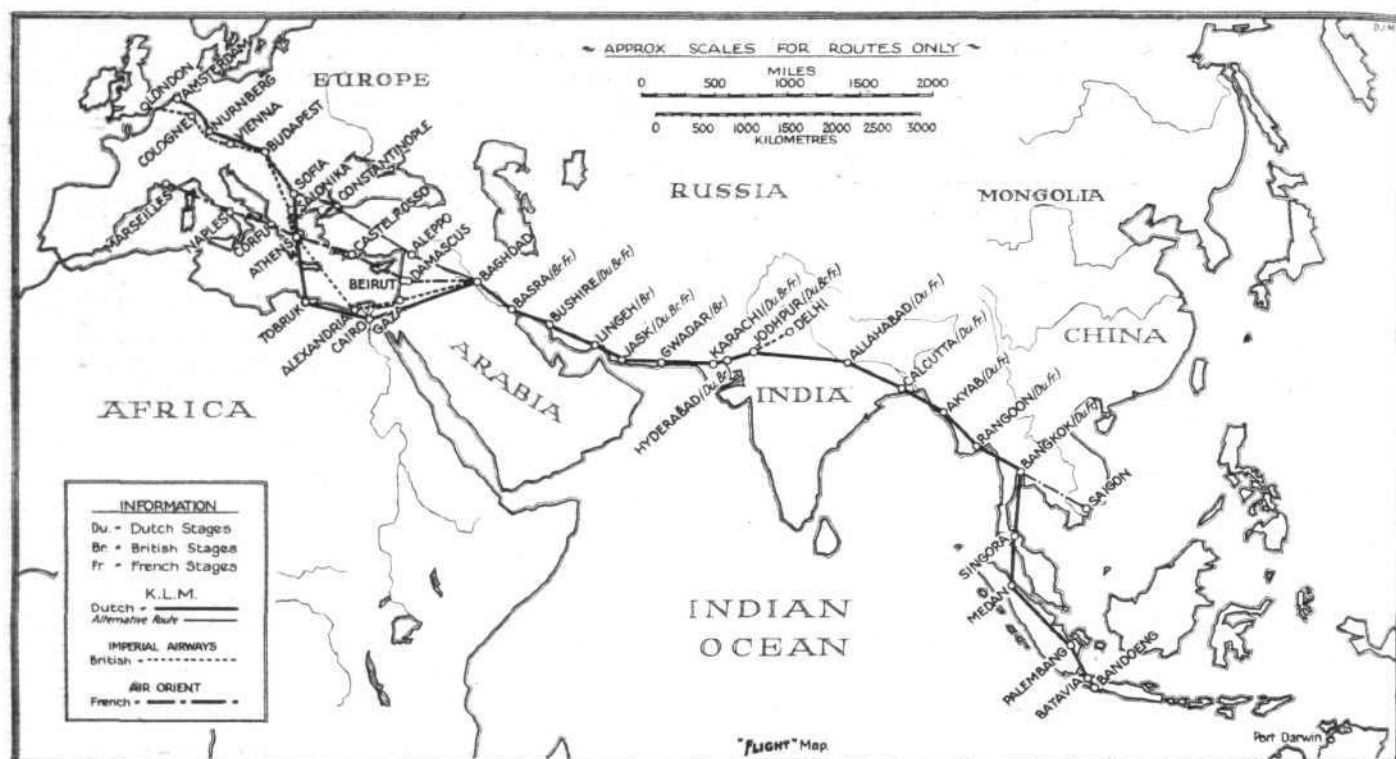
Table I.

Air speed in miles per hour	30	40	50	60	70	80	90	100
Primary type glider, h.p.	2.8	3.7	5.9	9.7	13.2	22.9	—	—
Secondary " " "	2.5	2.9	4.3	6.9	10.9	16.3	23.4	32.2
Sail 'plane " " "	2.2	2.3	3.3	5.1	8	12	17	23.5

Reference to Fig. 2 will give the ground speed in each case.



AIR TRANSPORT



TOWARDS AUSTRALIA

The Dutch Make a Good Start

By M. LANGLEY, A.M.I.Ae.E., A.M.Inst.N.A.

THE work of the K.L.M. (Royal Dutch Air Lines) in Europe is well known. On their routes from Amsterdam to London, Paris, Berlin and Malmö, the Dutch have built up a reputation for safety, efficiency, and comfort which is worthy of a much larger and more powerful nation.

In England we hear much on the subject of Imperial communications and of the value of fast air transport to the Empire. So far we operate a weekly service to India, and a branch line to South Africa is shortly to be opened.

The Dutch also have distant and important territories half-way round the world, and the similarity of their problem is of interest. The Dutch East Indies provide one of the most important sources of rubber, oil, and rare metals in the world. They cover 736,400 square miles of territory and have a population of over 50,000,000. Their distance from the mother country is of the order of 8,000 miles.

This route is not only of considerable importance to Holland, but, as may be seen from the accompanying map,

it follows the main airway to Australia, for the greater part being the same as that being developed by Imperial Airways, while the recently opened French line to Saigon also falls along the greater part of the same route.

I was recently given the opportunity of discussing the matter with Mr. A. Plesman, managing director of the K.L.M., and with several other officials of the company, including Mr. P. Guilonard, the chief engineer, and Mr. L. F. Bouman, manager of the Waalhaven air port, and the following brief notes concerning K.L.M. activities to and in the East Indies will, I hope, be of interest to FLIGHT readers.

Official interest in an air mail and passenger service to the Indies was first taken in 1919, when commissions were set up in Holland and Batavia to make reports. Their findings were entirely favourable, but no subsidy was secured. Further unsuccessful efforts were made in 1923 to start, and in 1924 the flight of Mr. Van der Hoop from Holland to the Indies renewed the public interest. In 1927 the Royal Dutch Indian Airways (K.N.I.L.M.) was formed to operate



THE START: The Fokker F.VII (Rolls-Royce "Eagle IX"), piloted by van der Hoop, leaving Amsterdam in November, 1924, on the first experimental flight to Batavia, Dutch East Indies. The route followed was much the same as that now used on the regular service, shown in the map at the top of this page.



Above is shown the Fokker F.VIIb, fitted with three Armstrong-Siddeley "Lynx," or Gnome-Rhone "Titan" engines, one of the types used both by K.L.M. and K.N.I.L.M. Another type used on the Amsterdam-Batavia line is the Fokker F.IX (three Bristol "Jupiters") shown below. The centre picture is an aerial view of Aleppo, on the original route to Batavia.



internal routes from Batavia as far as Medan and Surabaya. They entered into an agreement with K.L.M. whereby the latter would work the link between there and Holland. In the present article I will confine my remarks to this K.L.M. link, but will discuss the K.N.I.L.M. activities in a later article.

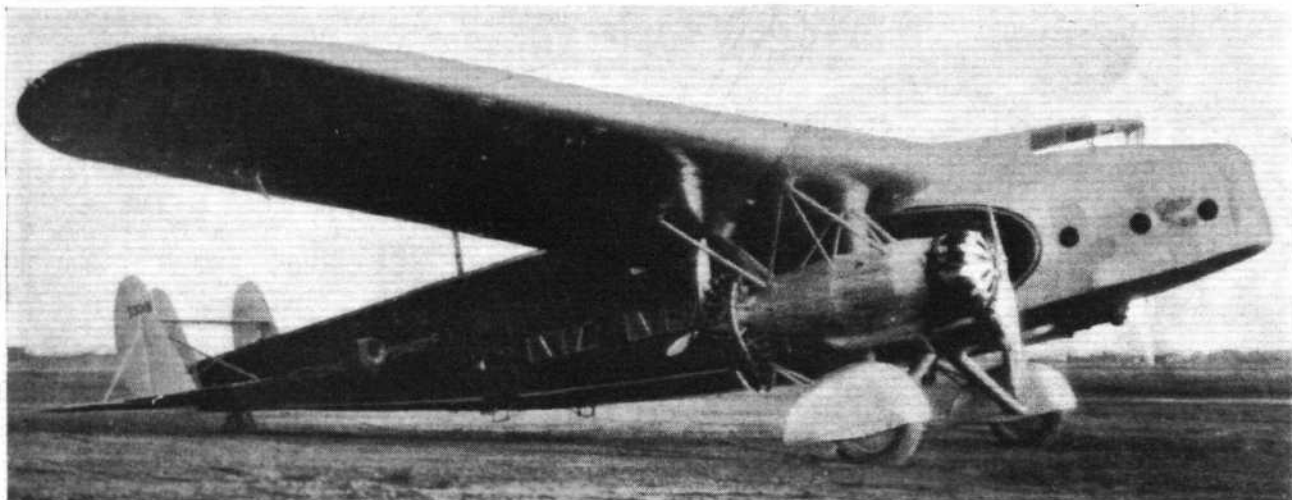
Mr. Plesman does not claim that a regular service has been permanently established yet. A considerable number of very successful flights have been made, and they are at present operating at fortnightly intervals.

These experiments may be divided into three periods covered respectively by the years 1928, 1929, and 1930. Two Dutch flights had taken place in 1927, but neither of these were worked by the K.L.M.

In September of 1928, four Fokker F.VIIb three-engined machines left Schiphol for Batavia. These belonged to K.N.I.L.M. and were being flown out for their use. They carried between 400 and 600 lb. of mail each. Only two purely K.L.M. flights were made that year, the first starting on October 11 and the second on December 11. Neither were particularly fast owing to minor troubles on the way.

Political difficulties arose in Iraq, and the second period begins nearly a year later, on September 12, 1929. Nine trips were made at fortnightly intervals thereafter until the British Indian Government declared their aerodromes to be unfit. The machines used were all Fokker VIIb with three Titan engines. Mail varying from 300 lb. to 700 lb. was carried on each journey.

The third period began on September 25, 1930, when the Indian Government had lifted its ban, and the service has since then been run on a fortnightly basis. With the exception of one special flight which will be dealt with later, the same Fokker VIIb machines have been used as in the



The Fokker F.32 (shown above), a large 4-engined machine (Pratt and Whitney "Hornet") developed in America, will probably be employed on the Amsterdam-Batavia route in the near future. An aerial view of the tin mines of Sinkep (Sumatra), between Singapore and Muntok is seen in the centre. Below is an incident of Lt. Koppen's pioneer mail flight in 1927, when his F.VIIb became bogged at Bangkok.

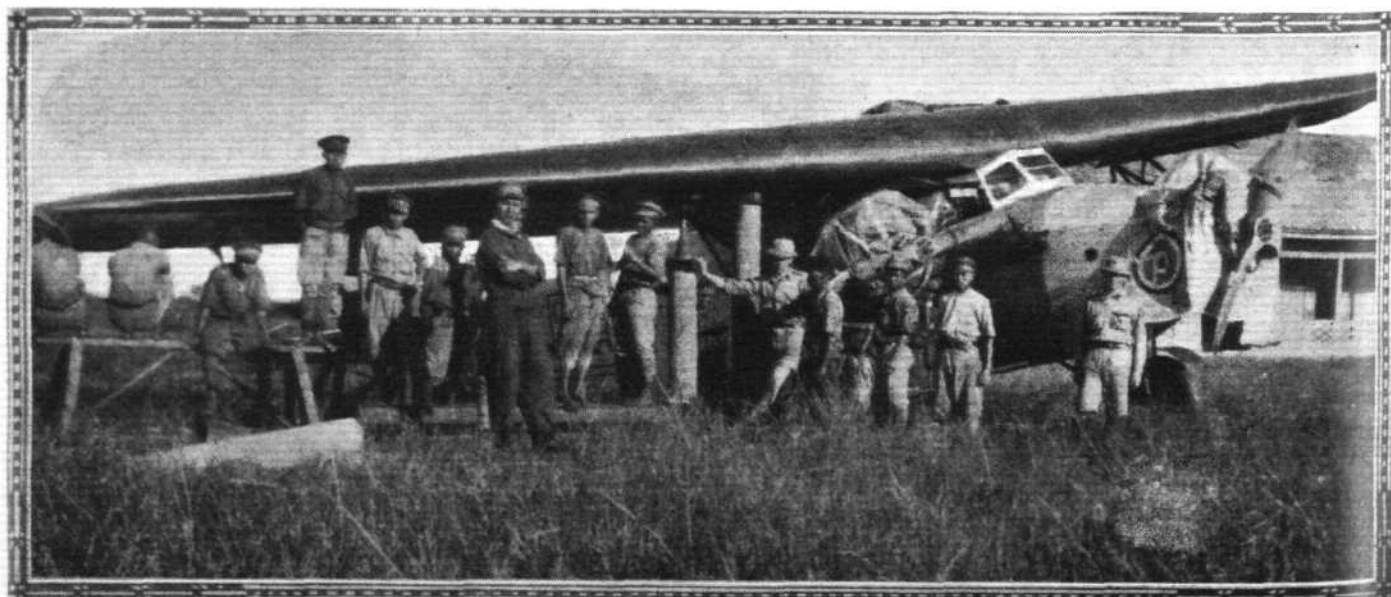
earlier periods. About 400 lb. of mail have been carried each time.

The first two outward trips were made by way of Constantinople, but permission to fly over Turkey was withdrawn. The Dutch were determined to carry the service through, and subsequent machines have crossed the Mediterranean from Athens to Metra-Marsu (Tobruk). This might be thought a daring procedure in anything but flying-boats. The pilots, however, have absolute faith in their equipment as a result of long experience, and declare the route to be less dangerous than a crossing of the Taurus Mountains to the north of Aleppo.

Two further sea crossings are involved, one between Calcutta and Akyab and the second over the Straits of Malacca. The 300 miles from Akyab to Rangoon takes the machines over an inhospitable stretch of mountains and jungle.

None of the F.VIIb's are fitted with wireless, and no great difficulties have been met on that account. Navigation is easy outside Europe, and the weather signs are usually unmistakable in advance.

Nevertheless, the K.L.M. have not ignored the question of radio control, and one special flight has been made to test the possibilities. For the service of November 27, 1930, a Fokker F.IX was sent out with Smirnoff as first pilot. The F.IX is a large 18-seater with three Jupiter engines. A double purpose was served by its use. It enabled the extra large Christmas mail of 800 lb. to be carried easily, in addition to a very complete radio equipment. Three sets—a long-wave, a short wave, working on a fixed aerial, and one for direction finding—were fitted. Long wave communication was maintained with numerous aerodromes as well as coastal wireless stations along the route, up to distances of 1,000 miles—especially on the way back, the short-wave equipment proved its value, as at Jodhpur, direct two-way communication



with Batavia at a distance of about 7,000 miles was still possible. The signals of the P.H.A.G.A. were heard in the Dutch East Indies when the machine was over Djash in the Persian Gulf. At the same time it came in touch with Schiphol Aerodrome.

As the long wave equipment is necessary for short-distance communication and for navigation purposes, it might be possible to carry in the future a relatively light long wave set, combined with a short wave transmitter and receiver. It will be realised that such equipment implies the use of a larger machine than the Fokker F VIIb, and also more ground stations than exist at present.

The K.L.M. are considering the use of larger and faster machines. Three types will be available, and a choice is to be made. The first of these is the Fokker F IX already mentioned. It is an 18-seater, similar in general appearance to the F VII 3m., with three Jupiter Series VI engines, and has a cruising speed of 109 m.p.h.

The second type is the Fokker F XII, a 15-seater similar to the F VIII at present used between Amsterdam and Croydon. It is fitted with three Pratt and Whitney Wasp engines, and it is expected to have a top speed of 140 m.p.h. Its cruising speed will be 120 m.p.h., but Mr. Guilonard anticipates that this could be increased to 125 m.p.h. by the use of Townsend rings and wheel fairings. Its ceiling when fully loaded will be 6,000 ft. on any two engines. The first F XII, which is nearly complete, will be flown next February.

The third alternative is the Fokker F-32, a much bigger machine to carry 30-32 passengers, with four Pratt and Whitney Hornet engines of 525 h.p. This type has been developed in America, and is employed on certain air lines out there.

Though the pay load of these machines is good and compares with any other commercial type available, it is not the only consideration. As Mr. Guilonard remarked, "Speed pays always. Pay load only pays when you can sell it."

Long Service

CAPT. H. S. LEVERTON, London Manager of K.L.M., completed 10 years' service with them on January 1 last. This constitutes, we believe, the longest period of continuous service with one air transport firm.

Improved Swedish Air Transport

AIR travellers from Sweden to the Continent will be able to have their breakfast in Malmö, the central terminus of the continental air routes in south Sweden, and to take tea in London or Paris seven hours later with only one intermediate landing in Amsterdam, where time for luncheon will be allowed. Capt. Florman, the director of the Swedish Aero-transport Company, announced that the service on the continental lines to Sweden in general will be improved and

Mr. Plesman drew my attention to the reduction in time which had already been achieved. In the first period of 1928 an average of 13 days was taken on the outward trips and 12 days on the homeward. In 1929 these figures were reduced to 12 days and 11 days respectively. They have now come down to 11½ days and 10½ days. The services, he says, must be run in 10 days regularly, with eight hours' flying per day. Night flying is not contemplated at the moment, though it may eventually be used to reduce the time to a week each way.

Owing to the higher initial cost and maintenance of flying-boats, land machines will be used throughout. The same aircraft and crew will do the round trip from end to end of the route. This centralises the staff of pilots, who naturally prefer a home base. And it requires only small depots of spare parts along the route to keep the machines in service.

With regard to the maintenance of the Fokker aircraft used, Mr. Guilonard gave me some interesting facts. Eight single-engined Fokker F VIIa machines have between them flown 20,516 hours. The first of these, which has been in service since September, 1925, had flown 3,620 hours without any repairs being necessary. The whole eight machines have cost a negligible amount, and most of them still have the original fabric on the fuselage. The same is true of five machines of the Fokker F VIII type, which have done 10,208 hours between them, whilst four of the type F VIIb have done 5,476 hours. The first of this last kind has totalled 1,776 hours without anything more than the replacement of an aileron cable being necessary. This particular machine, PH-AEN, has made five trips to Batavia. Mr. Guilonard thus has facts to support his opinion that the Fokker equipment of the K.L.M. has an infinite life. Many machines of earlier types, 10 years old, have been sold to other companies who are still operating successfully with them. This point is well worth the attention of those academic designers who strive after a theoretically efficient structure which takes little account of economic efficiency.

speeded up during the coming flying season, which is to begin as early as March 15. Both the Dutch and Belgian aviation companies have manifested great interest in increasing their service to Sweden. As soon as the Stockholm flying field at Bromma is perfected and equipped to meet the international demand for landing facilities, the continental lines will be extended to Stockholm. Plans for the further perfection of the air mail service are being completed, and at a recent conference between the directors of some leading European aviation companies it was decided, on the initiative of the Scandinavian representatives, to submit to the postal authorities of the European countries a proposal to eliminate the extra aviation postage fees for first-class mail for the time being.

CROYDON WEEKLY NOTES

WE said last week that the opening date of the Imperial route to the Cape was still uncertain. It has now been decided that the first section from Cairo to Mwanza will open on Thursday, March 5. Mwanza lies on Lake Victoria, and the distance is 2,670 miles. It will be reached by the first machine on March 9. This connects up with the service leaving London on February 28. The portion of the route between Khartoum and Mwanza will be operated by Short "Calcutta" flying-boats, the Nile and the lakes forming better aerodromes than any which could be prepared. Imperial Airways hope to have the whole service to the Cape in full operation some two to three months later.

They are also pushing on with their preparations for attracting more passengers on to all their routes during the coming season. An arrangement has been made with the White Star Line whereby the pursers of all their big passenger boats will act as booking agents for Imperial Airways, both for the regular services and for special charter work.

An agreement has also been reached with the Southern Railway for special "joy-ride" excursions from London. Parties of twenty or more will be met at either Waddon or East Croydon stations, taken to the aerodrome and given a 15-minute flight. The cost, not including the Southern Railway ticket, will be seven shillings a head.

Capt. J. J. Flynn ("Paddy") is making a wonderful recovery and he persists in being cheerful. His high spirits

are really inspiring and make one forget the little troubles and irritations of this workaday existence. It is extremely doubtful if he will ever be able to fly again. But his vast experience of flying and his knowledge of its people should not be lost to aviation—it is much too valuable. He has always been one of the most popular pilots, not only at Croydon, but over all of England and most of Europe.

A new transport company was recently started at Croydon by Mr. W. A. Rollason and operates under the name of the Rollason Aviation Co., Ltd. The equipment consists of a Desoutter, a Moth and two Avros, with which they do taxi work, instruction and joy riding. During the coming year it is hoped that the fleet will be increased considerably, especially for taxi work. Only very experienced pilots will fly for the Company, and Mr. Rollason has himself inspected 148 aerodromes in England which they can use. A scale of charges has been worked out from London to all these places and intermediate rates can quickly be quoted.

We hear from Mr. Olney that Cirrus Aero Engines, Ltd., have booked further repeat orders from both Japan and Poland—the latter being for the Inverted Hermes. This engine is now establishing itself all over the world and doing much to maintain the prestige of British engineering.

The traffic figures for the Air Port during the last ten days of the year 1930 were 407 passengers and 34 tons of freight.

M. L.

AIRISMS FROM THE FOUR WINDS

Miss Amy Johnson's New Venture

ON January 1, Miss Amy Johnson set out from Stag Lane Aerodrome on a far more ambitious venture than her Australian exploit of last year. Flying the D.H. "Gipsy Moth" *Jason III*, which was presented to her after her flight to Australia, she planned to journey to Pekin, via Warsaw and Siberia—a task involving at this time of the year great hardship and considerable risk. Even experienced Russian and Polish airmen regarded the flight with disfavour. Nevertheless, "Johnnie" was out for adventure and determined to try her luck—which, however, was against her from the start. In the first place, fog delayed her take off, and after a short halt at Lympne, she attempted to reach Berlin that night, but only got as far as Liège. Hard weather next day prevented her making Berlin, and she had to land at Cologne. Proceeding on December 3, she again encountered bad weather and lost her bearings, descending at Mecklenburg, where she was directed to Berlin. Miss Johnson eventually arrived there, in the dark and hours overdue, but was accorded a warm welcome, being received by Lady Rumbold, wife of the British Ambassador. Next morning she set out for Warsaw, but once again misfortune overtook her, for losing her way in the fog she had to land at the small Polish village of Amelin, 55 miles north of Warsaw. In landing, she damaged her machine, although she herself was unhurt. This mishap was probably a blessing in disguise, for in the resulting delay experts managed to persuade Miss Johnson to abandon her flight to Pekin—for the time being, anyway—although she will probably proceed to Moscow as soon as *Jason III* is repaired. *Jason III*, it may be added, is an exact replica of her original Moth, on which she flew to Australia, and is fitted with the identical extra petrol tanks. Miss Johnson wore a Russell parachute.

Italian Squadron's Triumph

TEN out of the twelve Italian seaplanes which set out from Bolama, Portuguese Guinea, on January 6, to fly in formation across the Atlantic to Brazil succeeded in reaching their destination. The flight was carried out in excellent order, and it was towards the end of the 1,900-mile journey that two of the machines dropped out; the crews were rescued, and according to some reports the machines were taken in tow by Italian warships. Gen. Balbo, Minister for Air, led the flight, Col. Maddalena being in command, and they were the first to alight on the Potengy River Harbour, Port Natal, amid the cheers of huge crowds gathered on the shore to welcome them. News of the arrival of the flying boats in Brazil was received with great enthusiasm in Italy, a gala performance at the Royal Opera House in Rome being interrupted for the news to be announced. The machines used in this remarkable flight are Savoia S.55 twin-hull flying boats, fitted with two Fiat A22 R 560-600 h.p. engines; all the flying boats were equipped with Smith's Mk. V Sextants, altimeters, Bygrave Slide-Rules, Air Speed Indicators, and Huson S.O.2 Aperiodic Compasses.

India-Africa Flights

MR. A. M. MURAD, one of the competitors for the Aga Khan's £500 prize for the first Indian to fly from Karachi to Cape Town, who left Karachi on December 28 last, crashed in the desert near Shaiba, 350 miles from Basra, on January 2. The pilot was unhurt, but the machine was damaged.

Lt.-Comm. Kidston's Lockheed Flight

MANY people know that Lt.-Comm. Kidston is planning a long-distance record flight on his recently purchased Lockheed "Vega." Wild and exaggerated statements have, however, been circulated in many quarters, particularly with regard to what he proposes to do and we therefore publish this week an authenticated statement. On Comm. Kidston's own authority, we can say that he hopes by his attempt to show the type of machine which should be built in this country, if we are to cater for such matters as high speed mail services or other long-distance high speed work. In this case, the Lockheed "Vega" has been fitted up with complete night flying equipment, a sending and receiving wireless installation, and many special instruments, including an earth inductor compass and all that is necessary for blind and long-distance flying. The wireless installation, which is by Heintz and Kauffman, is the same as was used by Wing-Comm. Byrd on his polar flight and enabled him to be in touch with New York when he was over the Great Ice Barrier. Special ventilation arrangements have been made to ensure reasonable cabin temperature in hot climates

and an extra fuel capacity provided which will give the machine a range of 1,500 miles, while the top speed is said to be 185 m.p.h.

A Message from Mrs. Victor Bruce

WHEN the Hon. Mrs. Victor Bruce telephoned from California to her husband on Christmas Day, she expressly asked him to convey, through FLIGHT, to her friends in the aircraft industry and to all the flying clubs with which she has been associated, her best wishes for the new year. Having made a forced landing at Medford, Oregon, Mrs. Bruce, who was slightly bruised, decided to spend the rest of Christmas Day in California instead of pressing on to New York. From New York she intends to fly to Buenos Aires, which will mean passing over country of even greater difficulty than the territories which she crossed over in making the first solo flight to Japan. Her plan is to make a complete circuit of the world in her Blackburn "Bluebird," with the exception of crossing the Atlantic and Pacific Oceans. When she gets back to London she will have done something like 40,000 miles, a record journey for a light aeroplane.

Another Australia-New Zealand Flight

THE de Havilland Co. have received notice that the Avro Avian, Southern Cross Junior (Gipsy II), flown by Mengies, has crossed from Sydney to New Zealand, a distance of some 1,300 miles across the sea, in 12 hr. 30 min. We can only say that Mr. Mengies must be braver than he is wise, however much cause he had to rely on his engine, and cannot have considered the detrimental effect on aviation in general which his demise would have had, had that flight failed. Such selfish attempts at gaining notoriety are, we think, to be most highly deprecated.

For all that, however, we feel it is only right that we should give credit to the technical aspect of the flight—for the performance of the Avian, especially its D.H. "Gipsy" engine, is undoubtedly a remarkable one.

Tanganyika Flight Fails

LORD LOVELACE, piloted by Capt. C. D. Barnard, who was flying to Tanganyika, met with a slight mishap on January 2, when the former's machine crashed near Tripoli, whilst flying from Tunis. Lord Lovelace and the mechanic were only slightly injured, and Capt. Barnard received leg injuries, while the machine was not very seriously damaged, but the flight had to be abandoned.

Another Atlantic Attempt

MRS. BERYL HART and Mr. William Maclaren left New York on January 3 in a cabin monoplane equipped with floats, and carrying a cargo of 200 lbs., with the object of flying to Paris via Bermuda and the Azores. A broken sextant, however, caused them to "miss" Bermuda and this, together with fog, made them decide to turn back. They landed in Hampton Roads after being 16 hours in the air.

More Fairies for Belgium

WE reported in FLIGHT the other week the splendid success of the Fairey Aviation Co., Ltd., of Hayes, in securing, against keen competition, an order from the Belgian Government for 45 "Firefly" single-seater fighters. Now comes the gratifying news that, following demonstrations—also in face of strong foreign competition—with the Fairey "Fox" two-seater high performance bomber, an order for this type of machine has also been placed by the Belgian Government. The Belgian Air Force, when it is equipped with these two types of machines, will have to be congratulated on possessing some of the best aircraft in the world, while the Fairey Aviation Co. are also to be congratulated on securing these and the recent Greek orders for their aircraft.

Aerodromes for Ireland

THE Irish Free State has suddenly awakened to its lack of aerodromes, and now towns of all sizes are coming forward with declarations that they have the ideal site for an Ireland to the Continent air service. Rumours are reaching Dublin of English and German companies who are supposed to be inspecting the sites offered, but on closer investigation the whole matter fizzles out. It has been suggested that when the Minister for Industry and Commerce returns from the League of Nations meeting in the Spring, there is a likelihood of his giving some attention to the problem of a suitable aerodrome for civil purposes, and possibly forming a small committee to inspect the many other sites for seaplane bases and landing grounds that are being offered all over the country.

THE MONOSPAR MONOPLANE

A Small Twin-Engined Cabin Aircraft

WE were recently privileged to fly this machine, and found it one of the most interesting little aircraft we have ever been in. No doubt many people at Hanworth will have already seen it, but for the benefit of those who have not, we will give a brief description of its main features. Details may not yet be divulged, as it is not properly on the market, but so much has been rumoured about this little machine, that no doubt its general specification will prove interesting. It is a low wing three-seater machine having provision for a third passenger behind the front two seats which are side-by-side. It is, of course, a completely closed-in cabin, and is also a twin-engined machine, having at present two 50-h.p. Salmson engines.

These drive tractor airscrews, and are situated quite close to the fuselage, so much so that four-bladed airscrews are necessitated. Dunlop wheels and Bendix wheelbrakes are fitted in such a manner that they work both in conjunction with the control column and the rudder bar.

When desired, they can be connected to the control column, so that both brakes are locked on when the column is held back, using left rudder will then release the right brake, and vice versa, so that these, together with the two engines, makes taxiing upon the ground almost a pastime, and it is really amazing to get in the machine and find how

easy it is to turn complete circles on one wheel and manoeuvre wherever one wants to. In the air, the machine bears out to a very large extent all one is led to expect of it. Even with these engines, for it was originally designed to take engines of a larger horse-power, the take-off is phenomenal, and it should be almost fool-proof. It can be turned with ease against one engine with the other one stopped, and all the controls appear to be exceptionally effective. There are, of course, several modifications which will have to be made, but that is only natural, as this first machine is frankly an experimental one, but, of course, embodies the Stieger monospar principle, both in the wing and the fuselage, and it will be interesting to see what part of the performance can be directly attributed to the use of this system. One of the first points which strikes one, is the view, which is unimpeded in all directions, and gives one an entirely new idea of flying in enclosed machines. The Aero Syndicate Limited, of 7, St. James's Street, S.W.1, have no doubt produced one of the most fascinating machines at present available for the private owner, and provided the production type is robust, with fittings which will stand up to wear much in the same way, as one expects those in a car to do, and that the machine will definitely fly with full load on one engine, we should imagine that there might well be a very good market for this type.

CORRESPONDENCE

[The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.]

WHO WILL OBEY WHAT?

[2359] Last week you published a letter from one Sandy McTavish, in which he offered further suggestions for the elaboration of a scheme I proposed in your columns on December 19, under the title of "I will obey."

I was glad to see that this article raised some interest, for I feel very strongly that now is the time when something serious should be done about the whole matter. If action is taken now we may be able to take full advantage of the coming season and I hope, educate the large numbers of the younger generation of airmen who will be taking to the air for the first time, on lines which should ensure safety for both them and ourselves.

There are one or two points in that letter which I should like to deal with if I may be allowed sufficient of your valuable space.

He refers to the fact that at some air-meetings there were as many as one hundred aircraft present, a fact which called for careful organisation and *whole-hearted co-operation of all concerned*. In the last words lies the crux of the whole matter and for such a scheme as I have suggested to be of the slightest use just that co-operation and nothing else will make it a success. Unfortunately few people seem to realise the importance of such co-operation and I well remember an occasion last year when there were many more than one hundred aircraft at a meeting. During the programme everything went smoothly and the organisation was perfect or as nearly so as we may expect from a nation of individualists; after the show was over, however, matters became hectic solely through lack of co-operation.

Actually what happened was that certain officials were entrusted with the safe dispatch of the large number of visiting aircraft, and they decided that the machines should taxi out in a particular direction in order to keep clear of those machines actually taking off. All the visitors showed that decent sense of co-operation which was hoped for, but some of the local instructors who wished to get on with joy-riding refused to follow the route, cut straight across the machines taking off and placed less experienced pilots in positions which caused considerable anxiety to those in charge. One can quite sympathise with those who are expert and who wish to gather shekels from the crowd on such occasions, but to do so in defiance of the officials they themselves have asked to take charge is merely being boorish and undoubtedly makes visitors feel that they are not wanted, besides creating

dangerous circumstances which, had those instructors thought on less selfish lines, could have been avoided.

It is this type of lack of co-operation which will break my scheme unless it is stamped out at the very beginning.

Your correspondent refers to the present and future traffic congestion around London.

Here, again, it is a question for co-operation. We have already been given a specified route for aircraft flying between Stag Lane and Heston, yet what percentage of light aircraft ever use that route? It would almost seem as if we never put any weight on official rules and regulations. Hence, my suggestion of appealing to people to make their own and to make the adherence to them a matter of common decency.

I feel Mr. McTavish is a trifle too hard when he talks of the Air Ministry . . . "despising its unlovely brother in a bowler hat and disdaining to compromise with commercial operators." (Why bowler hats? I only know of one commercial operator who flies in such head-gear and he resides in the North not in London!)

There are already reports as to a Committee which has been formed to go into the whole question of the regulations affecting civil aviation and the commercial side is well represented on that committee, so I do not think we need be unduly pessimistic.

The real issue, however, will still lie in our own hands, and unless we engender an attitude, such as I previously suggested, in the minds of existing and embryo pilots there is little doubt that we shall rapidly be engulfed in a wave of bureaucratic legislation such as our Socialist Government thinks necessary for the safety of democracy.

"DAEDALUS"

London, S.W.1.

MOUNTAIN AIRCRAFT

[2360] In the Editorial Comment of yesterday's issue of FLIGHT, re "Mountain Aircraft," you suggest the use of semi-rigid airships or multi-engined planes for this work, but would not the Autogiro be the ideal craft?

I would be glad to know what there would be against the use of this machine for such work.

I may mention that I have no connection with the Autogiro Company nor any other aircraft company.

LOUIS MANN.

London, N.W.9.

December 13, 1930.

THE R.A.F. BALTIC CRUISE

ALTHOUGH we have already briefly recorded, week by week, the cruise in the Baltic Sea, of the four Supermarine "Southampton" flying boats of No. 201 (F.B.) Sqn., R.A.F., under Group Capt. E. R. C. Nanson, C.B.E., D.S.C., last September, we think the following official report on the cruise will be of interest.

The object of the cruise was to provide training to the personnel of a flying-boat squadron operating away from its base for a month. Petrol and oil were provided, but, apart from this, the flying-boats were entirely self-contained.

Valuable experience and training was obtained during the cruise in landings and manoeuvring in strange harbours and mooring up to various types of buoys, and also in refuelling the flying-boats in various ways and under different conditions.

Narrative of Cruise

Four flying boats of 201 (F.B.) Squadron left Calshot for Felixstowe on September 2 to carry out an extended cruise in the Baltic Sea during the month of September. The boats were refuelled at Felixstowe on arrival, and left the next day for Esbjerg, the sea-crossing taking about 6 hr. All boats were refuelled at Esbjerg on the morning of September 4, and inspections of machines and engines were carried out.

On September 5, the Squadron left for Copenhagen, and crossed the southern part of Jutland at a height of 3,000 ft., the land crossing being about 30 miles. On arrival at Copenhagen, the aircraft were refuelled during the afternoon from a refuelling boat. On September 6, machine and engine inspections were carried out in the forenoon, and aircraft were visited and inspected during the afternoon by H.M. Minister and officers of the Danish Naval Flying Service. H.M. Minister and the Rear-Admiral Commanding the Air Service were given a flight.

On Sunday, September 7, the wind sprang up from the north north east and it was impossible to approach the boats in dinghies, owing to the rough sea. At 0200 on September 8, it was reported the S. 1228 was drifting ashore. The crews of the aircraft and the personnel of the station entered the water and, when the machine had drifted close enough, secured lines aboard by which they dragged her to the slipway. This action was considered to be the only possible means of saving the machine, and owing to the promptness with which it was carried out, no damage was sustained.

Later during the day, when the sea appeared calmer, the aircraft was taxied back to her moorings. It was found impossible to take the crew off in a dinghy, so they were floated astern in a rubber dinghy, two at a time, and picked up by a motor boat.

The cause of the breaking away of S. 1228 was that her main pennant and Yarmouth gear were secured to a patent spring hook in the mooring wire, and this hook had pulled out straight. During the gale, S. 1058 and S. 1229 dragged their moorings about 100 yards. The gale gradually abated during September 8, but still the boats could not be boarded, and the departure of the squadron for Stockholm had to be delayed a day.

On the morning of September 9, a thorough inspection of all boats was carried out, and the Squadron left for Stockholm. S. 1234 forced landed south of Cape Sandhammar, at 1130 hr., but signalled that she would require no assistance, and actually proceeded in about 10 min. The cause of the forced landing was a cracked oil pipe from the engine to the oil-pressure gauge. Three machines arrived at Stockholm at 1640 hr. S. 1234 arriving at 1700 hr.

On September 10, 25 hr. inspection of machines and engines was commenced, and the machines refuelled during the day. Inspections were continued on the 11th and were finished by midday. September 12 was given over to sight-seeing. Before leaving on September 13, S. 1228 changed the airscrew on the starboard engine for the spare one which was carried. On taking off, however, the vibration was found to be worse, and so the machine landed again at Stockholm and replaced the original airscrew.

S. 1058, S. 1229, and S. 1234 arrived at Helsingfors at 1420 hr., and S. 1228 at 1540 hr., having been further delayed by a slight oil-pressure trouble.

The boats were refuelled during that afternoon, and the morning of the following day. Inspections were carried out on the 14th, and the starboard radiator of S. 1228 taken ashore in order that a small leak should be stopped.

During the morning of the 15th the boats were cleaned up, and later visitors were received. The British Minister and the General Commanding the Finnish Air Force were given a flight.

The Squadron left Helsingfors for Tallinn (Reval) on September 16, arriving at 1030 hr. Refuelling was carried out from a lighter. Flights were given to the British Minister and three distinguished Estonian Military and Air Force officers.

The Squadron left Tallinn for Riga on September 18. Aircraft took off independently from outside the harbour, where a rough sea was running, but got off without difficulty. S. 1228 was delayed with oiled plugs on the port engine, but followed shortly afterwards. On arrival at Riga, the formation was met by a Latvian seaplane and escorted to the Stintsee, where the moorings were laid. All machines refuelled on September 19, and a 15-hr. inspection was carried out on the engines and aircraft. A flight was given to two distinguished Latvian military officers.

The Squadron left Riga for Memel on September 20, and were escorted to the Latvian-Lithuanian Frontier by a flight of three Latvian seaplanes. The moorings at Memel were laid in the river, and a landing was made alongside the buoys, the wind fortunately being up and down the river. One boat refuelled on arrival, the remainder refuelling on the following day.

The Squadron left Memel on September 22, and landed at Puck without

incident. Refuelling was commenced the following day from rowing boats, each machine using its Zwicky pump.

On September 24, the Squadron left Puck and flew over Gdynia, the Polish Naval Base, at the request of the Polish Naval Authorities. The Squadron continued to Stockholm, and arrived without incident.

At Stockholm, 25-hr. inspection of engines and machines were carried out and machines were refuelled on arrival, the refuelling being completed on the following day, September 25. The petrol was brought alongside in 50-gallon drums in dinghies and Zwicky pumps were used. The British Minister was given a flight.

On September 26 the Squadron left for Goteborg, and landed in the river, outside the Naval Harbour. The original scheme was for the buoys to be laid in the Civil Aviation Harbour, some way outside Goteborg, but the Swedish Naval Authorities decided to alter the position of the buoys in order to make them more convenient to the city.

On September 28, the Squadron left for Oslo, and made the destination in very fine weather and without incident. Refuelling was carried out the following day from a petrol barge using a semi-rotary pump, and hose provided by the Shell Co.

The Squadron left Oslo for Esbjerg on October 1, and arrived at 1830 hr. All boats refuelled on arrival, and inspections were carried out that evening.

On October 2, the Squadron left Esbjerg for Felixstowe. S. 1234 landed at 1350 hr. in the North Sea, with a serious oil leak. It was found that the vertical drive of the starboard engine (starboard block) had become unscrewed. This was tightened up, and the machine proceeded with the others and arrived at Felixstowe at 15.45 hr., and refuelled on arrival. The aircraft left Felixstowe at 0930 hr., arriving at Calshot at 1145 hr.

Weather Reports

The organisation provided by the Meteorological Office, Air Ministry, for the supply of weather forecasts worked extremely well.

The Meteorological Bureau at Stockholm was of the greatest assistance in providing forecasts and reports before leaving Copenhagen and supplying further reports, through radio stations, en route. Again, on Putzig-Stockholm and Stockholm-Goteborg flights, several weather reports were received via Stockholm, Flyghamn (Airport) Radio from places on the route, which were of great value.

Generally, the weather throughout the month of September at the places visited was good. It appeared, however, that the Squadron's itinerary coincided generally with fair weather. Adverse winds were generally experienced, but not of considerable force.

"Rain-fog," in conjunction with rough sea and strong winds only prevented the Squadron's departure on one occasion, viz., from Copenhagen. Delay of one to two hr. was also necessitated by fog locally at Memel, and on the Stockholm-Goteborg route. Visibility on Esbjerg-Felixstowe flight on October 4, 1930, was very poor, varying between 1,000 yards and three miles with a maximum of five miles. At Copenhagen, Helsinki and Putzig, the Air Forces of these countries provided the Squadron with their own forecasts.

Personnel

The personnel was as follows:—

Southampton S. 1229.—Group Captain E. R. C. Nanson, C.B.E., D.S.C., A.F.C., commanding; Sqn.-Ldr. E. F. Turner, A.F.C., First Pilot; Flt.-Lieut. M. C. Pascoe, Second Pilot and Navigator; No. 335772 Corp. L. Porter, Fitter; No. 342743 Corp. P. Bristow, Wireless Telegraph Operator.

Southampton S. 1228.—Group Captain E. L. Gossage, D.S.O., M.C., Air Attache, Berlin, Passenger; Flt.-Lieut. A. C. Stevens, First Pilot; Flying Officer R. B. Council, Second Pilot; No. 243942 Corp. Osborne H., Fitter; No. 359229 A.C. 2 F. Gore, Wireless Telegraph Operator.

Southampton S. 1234.—Flt.-Lieut. R. L. Ragg, A.F.C., First Pilot; Flying Officer K. F. Jones, Second Pilot; No. 335903 Sergt. S. Field, Fitter; No. 349454 Sergt. F. Roberts, Rigger; No. 370032 L.A.C. A. Revell, Wireless Telegraph Operator.

Southampton S. 1058.—Flt.-Lieut. G. H. Smith, First Pilot; Flying Officer E. J. Laine, Second Pilot; No. 17396 Flt.-Sergt. A. Brookern, Rigger; No. 363590 L.A.C. V. Carter, Fitter; No. 354841 L.A.C. W. J. French, Wireless Telegraph Operator.

Itinerary of Cruise

Date	From—	To—	Distance	Total Hours
			Sea-miles	Flown.*
Sept. 2	Calshot	Felixstowe	159	11 20
Sept. 3	Felixstowe	Esbjerg	333	24 05
Sept. 5	Esbjerg	Copenhagen	200	13 20
Sept. 8	Copenhagen	Stockholm	358	25 45
Sept. 13	Stockholm	Helsingfors	225	17 10
Sept. 16	Helsingfors	Tallinn	43	4 10
Sept. 18	Tallinn	Riga	181	10 30
Sept. 20	Riga	Memel	206	13 30
Sept. 22	Memel	Putzig	109	7 40
Sept. 24	Putzig	Stockholm	286	15 50
Sept. 26	Stockholm	Goteborg	301	16 15
Sept. 28	Goteborg	Oslo	148	10 30
Oct. 1	Oslo	Esbjerg	290	16 35
Oct. 2	Esbjerg	Felixstowe	333	22 40
Oct. 3	Felixstowe	Calshot	159	10 25
Totals			3,331	220 15
Local flying time				6 05

Total time *226 20

* Total hours flown is the flying time of the four aircraft.

Air Pageant for Dublin this Year

OUR Irish correspondent says it is suggested in Dublin that there will be an air pageant in Ireland during the summer of this year under the auspices of the Irish Aero Club. The suggested rendezvous for the pageant is the Phoenix Park, quite close to the city of Dublin itself, and where there would be plenty of room for a temporary aerodrome. The Irish newspapers have taken up the idea, but, unfortunately, have suggested gliding as an additional feature. In the County Dublin this is impossible, owing to the heavy prevailing winds being from the west. These cause a severe downdraught,

which is bad enough while flying an ordinary machine, but would be hopeless for gliding. An enquiry at the offices of the Irish Aero Club elicited the information that such a pageant is likely, but the club will have to become members of the Federation Aeronautique Internationale before anything definite can be said. The whole matter will probably be decided at the annual meeting of the club, which takes place at the end of this month.

Aerodromes for Czechoslovakia.

CZECHOSLOVAKIA is constructing six new aerodromes, and erecting 13 aerial beacons.

THE ROYAL AIR FORCE

London Gazette, January 2, 1931
General Duties Branch

The short service commission of Pilot Officer on probation E. G. Barter is terminated on cessation of duty (Dec. 31, 1930); Flying Officer E. A. Airy (Lt., The Buffs) relinquishes his temp. commn. on return to Army duty (Dec. 17, 1930).

Medical Branch

Flying Officer D. D. Watson, M.B., Ch.B., resigns his short-service commn. (Dec. 17, 1930).

Erratum

In Gazette of Dec. 19, 1930. For W. Pickersgill (Sub-Lt., R.N.R.), read W. Pickersgill (Sub-Lt. R.N.R.).

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

T. A. W. White is granted a commn. in Special Reserve as Pilot Officer on

probation (Dec. 8, 1930). The following Pilot Officers are promoted to rank of Flying Officer:—C. G. Higgins (Dec. 4, 1930); R. D. Bednell (Dec. 12, 1930); A. C. Buck (Dec. 20, 1930); C. P. S. Smith (Dec. 20, 1930); R. G. Shaw (Dec. 21, 1930); W. Clarke (Dec. 24, 1930); R. S. Sikes (Dec. 24, 1930); I. B. Sherring (Dec. 26, 1930); L. Swan (Dec. 26, 1930); K. Shenstone (Dec. 27, 1930). Flying Officer F. Davison, of Special Reserve, is promoted to rank of Flight Lieutenant (Nov. 7, 1930).

AUXILIARY AIR FORCE

Accountant Branch

No. 608 (NORTH RIDING) (BOMBER) SQUADRON The following to be Pilot Officer.—W. U. Hodson, M.C. (Dec. 23, 1930).

PRINCESS MARY'S ROYAL AIR FORCE NURSING SERVICE

Sister Miss W. M. Cave resigns her appointment (Dec. 27, 1930).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the R.A.F. are notified:—
General Duties Branch

Air Commodores: P. H. L. Playfair, C.B., M.C., to H.Q., R.A.F., India, pending duty as Chief Staff Officer; 17.12.30. C. L. Courtney, C.B.E., D.S.O., to H.Q., Iraq Command, for duty as Chief Staff Officer; 18.12.30.

Group Captain A. D. Cunningham, O.B.E., to No. 4 Flying Training School, Middle East, to command; 19.12.30.

Squadron Leader A. W. Fletcher, O.B.E., D.F.C., A.F.C., to Elec. and Wireless School, Cranwell; 15.12.30.

Flight Lieutenants: A. H. Montgomery, to H.Q., Iraq Command; 19.12.30. E. K. D. Robertson, A.F.C., to R.A.F. Depot, Uxbridge; 1.12.30. E. S. Moulton-Barrett, to R.A.F. Depot, Uxbridge; 1.12.30. B. A. S. Lewin, to Home Aircraft Depot, Henlow; 16.12.30. N. O. Seward, to No. 3 Flying Training School, Grantham; 17.12.30. A. J. Holmes, to R.A.F. College, Cranwell; 17.12.30. The Earl of Bandon, to H.Q., R.A.F., Middle East; 28.12.30.

Flying Officers: H. C. Marett, to No. 41 Sqn., Northolt; 16.12.30. T. W. Walker, to No. 16 Sqn., Old Sarum; 23.12.30. N. H. Thompson, to No. 4 Sqn., S. Farnborough; 23.12.30. J. B. M. Wallis, to R.A.F. Training Base, Leuchars; 17.12.30. W. G. Stevenson, to No. 3 Flying Training School, Grantham; 17.12.30. R. S. Darbyshire, to No. 2 Flying Training School, Digby; 17.12.30. J. Beaumont, to No. 5 Flying Training School, Sealand; 17.12.30. C. E. Kay, to No. 2 Flying Training School, Digby; 17.12.30. H. L. Piper, to No. 2 Flying Training School, Digby; 17.12.30. A. F. Anning, to R.A.F. College, Cranwell; 17.12.30. N. W. A. Cullum, to No. 3 Flying Training School, Grantham; 17.12.30. P. Le M. C. Beaton, to No. 2 Flying Training School, Digby; 17.12.30. E. S. Greenwood, to No. 3 Flying Training School, Grantham; 17.12.30. H. Kerr, to No. 3 Flying Training School, Grantham; 17.12.30. G. H. Clarke, to No. 3 Flying Training School, Grantham; 17.12.30. W. J. H. Lindley, to No. 2 Flying Training School, Digby; 17.12.30. A. G. Adams, to No. 5 Flying Training School, Sealand; 17.12.30. D. S. McDougall, to R.A.F. College, Cranwell; 17.12.30. L. P. Rowley, to No. 3 Flying Training School, Grantham; 17.12.30. G. O. St. J. Morris, to No. 5 Flying Training School, Sealand; 17.12.30. G. F. Humphries, to No. 2 Flying Training School, Digby; 17.12.30. B. W. Knox, to No. 25 Sqn., Hawkinge; 19.12.30. E. B. Webb, to R.A.F. Base, Gosport; 27.12.30.

Pilot Officers: K. N. Severs, to R.A.F. Depot, Uxbridge; 11.12.30. J. Bamber, to No. 2 Sqn., Manston; 23.12.30. R. A. McMurtrie, to No. 2 Sqn., Manston; 23.12.30. G. Silvan-Roberts, to No. 2 Sqn., Manston; 23.12.30. C. R. F. Wintringham, to No. 2 Sqn., Manston; 23.12.30. W. B. Bailey, to No. 4 Sqn., S. Farnborough; 23.12.30. W. T. Ratcliffe, to No. 4 Sqn., S. Farnborough; 23.12.30. M. F. Summers, to No. 4 Sqn., S. Farnborough; 23.12.30. B. P. Reynolds, to No. 13 Sqn., Netheravon; 23.12.30. M. G. C. Chadwick, to No. 26 Sqn., Catterick; 23.12.30. C. W. W. S. Conway, to No. 26 Sqn., Catterick; 23.12.30. R. J. R. H. Makgill, to No. 7 Sqn., Worthy Down; 23.12.30. G. G. Stead, to No. 7 Sqn., Worthy Down; 23.12.30. L. E. Dalrymple, to No. 9 Sqn., Boscombe Down; 23.12.30. L. W. V. Jennens, to No. 9 Sqn., Boscombe Down; 23.12.30. W. R. Ottewill, to No. 10 Sqn., Upper Heyford; 23.12.30. A. R. T. Coke, to No. 33 Sqn., Bicester; 23.12.30. A. R. Wilson, to No. 33 Sqn., Bicester; 23.12.30. R. A. Byrne, to No. 35 Sqn., Bircham Newton; 23.12.30. E. M. Gurney, to No. 35 Sqn., Bircham Newton; 23.12.30. C. J. Farrell, to No. 58 Sqn., Worthy Down; 23.12.30. G. R. White, to No. 58 Sqn., Worthy Down; 23.12.30. W. C. Pitts, to No. 99 Sqn., Upper Heyford; 23.12.30. R. B. Whittingham, to No. 101 Sqn., Andover; 23.12.30. D. J. Alvey, to No. 9 Sqn., Boscombe Down; 23.12.30. H. F. Chester, to No. 207 Sqn., Bircham Newton; 23.12.30. R. P. J. Leborgne, to No. 10 Sqn., Upper Heyford; 23.12.30. D. W. Lucke, to No. 207 Sqn., Bircham Newton; 23.12.30. G. J. Holland, to No. 26 Sqn., Catterick; 23.12.30. H. W. Riley, to No. 10 Sqn., Upper Heyford; 23.12.30. E. V. N. Bramley, to No. 12 Sqn., Andover; 23.12.30. A. W. R. Lawson, to No. 33 Sqn., Bicester; 23.12.30. L. E. B. Stonhill, to No. 35 Sqn., Bircham Newton; 23.12.30. E. Elgey, to No. 99 Sqn., Upper Heyford; 23.12.30. W. B. Thompson, to No. 207 Sqn., Bircham Newton; 23.12.30. S. S. Murray, to No. 3 Flying Training School, Grantham; 17.12.30. F. C. Cole, to R.A.F. College, Cranwell; 17.12.30. C. A. Watt, to R.A.F. College, Cranwell; 17.12.30. J. A. Powell, to No. 2 Flying Training School, Digby; 17.12.30.

The undermentioned Pilot Officers are posted to No. 4 Flying Training School (Middle East) with effect from 19.12.30:—B. A. Casev, W. Dumme, E. R. S. Johnston, K. Lea-Cox, H. W. Marlow, A. H. Marsack, W. Pickersgill, M. Sorsbie, H. L. Tancred, J. R. Wemyss, E. W. Whitley, and F. W. Yates.

NEW YEAR PROMOTIONS

The undermentioned promotions are made with effect from January 1, 1931:—

General Duties Branch

Air Vice-Marshal to be Air Marshal.—Sir Robert Brooke-Popham, K.C.B., C.M.G., D.S.O., A.F.C.

Air Commodore to be Air Vice-Marshal.—Felton Vesey Holt, C.M.G., D.S.O. **Group Captains to be Air Commodores.**—Robert Peel Ross, D.S.O., A.F.C. A.D.C.; Christopher Lloyd Courtney, C.B.E., D.S.O.; Charles Edward Henry Rathborne, D.S.O.

Wing Commanders to be Group Captains.—John Hugh Samuel Tyssen, M.C.; Augustine ap Ellis, C.B.E.; Alexander Charles Winter, O.B.E.; Arnold John Miley, O.B.E.; Archibald Corbett-Wilson; Arthur William Tedder; Bertine Entwistle Sutton, D.S.O., O.B.E., M.C.; John Walter Cordingley, O.B.E.

Squadron Leaders to be Wing Commanders.—George Horace Paty Padley; Leslie Frederick Forbes, M.C.; Thomas Vaughan Lister; Alfred Samuel Morris, O.B.E.; Arthur Leslie Gregory, M.B.E., M.C.; Ronald Hargrave Kershaw; Henry Stewart Powell, M.C.; Eric Bentley Beauman; Louis Clement Keeble; Arthur Willoughby Falls Glenny, M.C., D.F.C.; Francis Edward Philip Barrington; Henry Ivan Hammer, D.F.C.; Arthur John Capel, D.S.O., D.F.C.

Flight Lieutenants to be Squadron Leaders.—Charles Henry Chapman Woolven, M.C.; Andrew Ronald MacKenzie; Charles Kingsley Chandler, M.B.E.; Bertrand Alexander Malet, D.F.C.

Flying Officers to be Flight Lieutenants.—Isaac Hodgson; Thomas Charlie Penna; James Rodger, D.S.M.; Robert Angus Whyte; William George Kentfield; Charles Snow; William Robert Heywood; Horace Alfred Castaldi; William Arthur Thompson; Herbert Little; John William White; Gilbert Lambourne; Archibald Henry Harrison, D.S.M.; Frederick John Knowler; Thomas James Edward Thornton; Frank Leslie Kingham; Archibald Edwin Gliddon, D.S.M.; Edward Frederick Thorpe; Arthur Henry Simmonds; Frederick Horace Cashmore; George Edward Litton; Vernon Frank Whatling, D.S.M.; Harold Featherstone Luck; Douglas

Donald MacAlister Eastwood; James William Bell, D.S.M.; Ian Ross Grant, (Lt.-Cdr., R.N.); Hugh Ditton (Lt. R.N.); John Benjamin Heath (Lt., R.N.); Noel Thomas Goodwin; Charles Ivor Arthur Jackson (Lt. R. Tank Corps).

Supplementary List.

Flying Officer to be Flight Lieutenant.—Charles Ignatius Sempill, M.M.

Stores Branch.

Flight Lieutenants to be Squadron Leaders.—William Arthur Kingston, Edwin Harold Eldridge.

Flying Officers to be Flight Lieutenants.—Albert James Redman, D.F.C.; Leslie John Vernon Bates; Fitzgerald Charles Cecil Baron Hichens; John Henry Purcell Clarke; Fred Ball Ludlow, O.B.E., M.C.; Harold David Gillelt; Osmond George Ridley, M.C.

Accountant Branch.

Flight Lieutenants to be Squadron Leaders.—Frederick William Arthurton; Kenneth Robertson Money, O.B.E.

Flying Officers to be Flight Lieutenants.—Harold James Titherington; Sidney Charles George.

Medical Branch

Wing Commander to be Group Captain.—William Tyrrell, D.S.O., M.C., M.B., B.Ch., D.P.H.

Squadron Leader to be Wing Commander.—Kenneth Biggs, M.C., M.R.C.S., L.R.C.P., D.P.H.

PRINCESS MARY'S ROYAL AIR FORCE NURSING SERVICE

Senior Sister (Acting Matron) to be Matron.—Miss Bessie Cowie Simpson Forsyth.

Sister (Acting Senior Sister) to be Senior Sister, Acting Matron.—Miss Gladys Taylor.

Sister to be Acting Senior Sister.—Miss Jessie Dorothy Jackson.

New Director of Civil Aviation

THE Air Ministry announces:—The Secretary of State for Air has, with the consent of the Government of India, appointed Lieut.-Colonel Francis Claude Sheldermine, O.B.E., at present Director of Civil Aviation in India, to the vacant

post of Director of Civil Aviation in the Air Ministry. Lieut.-Colonel Sheldermine, after serving in the Royal Flying Corps and Royal Air Force during the war, held appointments under the Directorate of Civil Aviation, both at home and in Egypt, up to the date of his transfer to India in 1927.

MODELS

SOCIETY OF MODEL AERONAUTICAL ENGINEERS

THE Annual General Meeting of the Society of Model Aeronautical Engineers will be held on January 29, 1931, at the Y.M.C.A., Tottenham Court Road, W.C., at 8 p.m. Nominations for the officers of the Society, or suggested alterations to rules, etc., must reach the Hon. Secretary by Wednesday, January 21.—S. G. Mullins, Hon. Secretary, S.M.A.E., 72, Westminster Avenue, Thornton Heath, Surrey.

THE MODEL AIRCRAFT CLUB (T.M.A.C.)

Indoor Flying

THE following dates have been provisionally fixed for the indoor flying meetings, of the T.M.A.C.: January 28; February 11, 18, and 25; March 11, 18 and 25. These meetings are held at the Horticultural Hall, Vincent Square, Westminster, S.W.1.

Should the hall, however, be required for any other purpose on any of these dates, previous notice will be given, if possible.

Wimbledon Common

On Sunday, January 18, the inaugural meeting of the 10th Wing will be held at 11 a.m. when an illuminated certificate will be handed to Wing Commander A. T. Willis. Those who are desirous of being in this wing should make a point of being present.

Bexley Heath

Those who are desirous of joining this Wing should communicate with T. Newell, Esq., 32, Veroan Avenue, Bexley Heath, Kent, or with the hon. secretary. Other wings are in the course of formation, full particulars will be published at an early date. A. E. Jones, hon. secretary, 48, Narcissus Road, West Hampstead, N.W.6.

EAST ANGLIAN MODEL FLYING CLUB

IT is proposed to form a model aircraft club embracing the whole of the Eastern counties, with headquarters in one of the large towns. The advantages of such a system over that of a number of separate clubs are many.

Separate squadrons and flights will be formed and will be self-supporting as far as possible, but the great advantage of the scheme is that in districts where members are scarce, they need not work in isolation, but receive information, advice and assistance not only from neighbouring flights, but also from headquarters. Separate squadrons might work in friendly rivalry, and competitions between them would be a feature.

The scheme is sponsored by a genuine amateur with no axe to grind, who has been making model aeroplanes since 1909, and who is prepared to render all possible assistance to further the interests of the sport.

Any responsible person who would care to co-operate in the formation of a squadron in his district or any official of an existing club, is invited to communicate with the secretary of the Southend-on-Sea Model Aero Club, 43, Northview Drive, Westcliff-on-Sea, Essex.

Some excellent flying has recently been done by members of this club, who have received instruction and help from the originator of this scheme. Sunday, December 21, being a good day for flying 13 machines appeared, and put up some very good flights; a feature of the meeting being the consistently good performance by the youngest member with his first machine, who succeeded in raising the club record for this type of machine by one second.

Gloucester and Cheltenham Branch, R.Ae.S.

THE following lectures will be delivered before the Gloucester and Cheltenham Branch of the Royal Aeronautical Society:—January 15, "Rigging and Assembly of Aircraft," by W. E. Vick, A.R.Ae.S.I.; January 22, "Aeroplane Controls, Faults and Diagnosis," by W. James; February 19, "The Heat Treatment of Steels," by A. L. Williams, B.Sc., A.M.I.M.E.

Sir Sefton Brancker's Estate

AIR VICE-MARSHAL SIR WILLIAM SEFTON BRANCKER, K.C.B., Director of Civil Aviation, who was killed at Beauvais,

France, in the wreck of the R 101, on October 5, aged 63, left property of the gross value of £6,990, with net personalty £5,944. The will, made on paper headed 120, Piccadilly, W.1, and dated August 22, 1927, is proved by Henry Jones, of the Air Ministry. The testator left everything to Miss Auriol Lee, of 9, Queen Street, Mayfair, W.

PUBLICATIONS RECEIVED

Aviation of To-Day: Its History and Development. By J. L. Nayler and E. Ower. London: Frederick Warne and Co., Ltd. Price 15s. net.

Gliders and Gliding. By R. S. Barnaby. New York: The Ronald Press Company. Price 3 dols.

Deckblätter zu den Bauvorschriften für Flugzeuge. November, 1930. Deutschen Versuchsanstalt für Luftfahrt, E. V., Berlin-Adlershof.

Air Stamp Catalogue and Guide to Aero-Philately. First edition, 1931. Stanley Gibbons, Ltd., 391, Strand, London, W.C.2. Price 2s. 6d. net.

Desk Calendar and Diary, 1931. The United Steel Companies, Ltd., Sheffield.

Catalogues

Higgs Motors. Walter F. Higgs, Witton, Birmingham.

NEW COMPANIES REGISTERED

ATLANTA SERVICE PARTS, LTD.—Capital, £100 in 1s. shares. Acquiring the business of a manufacturers' agent and representative, etc., heretofore carried on by W. P. G. Stephens at Old Vicarage Road, Exeter, as "W. P. G. Stephens," and to carry on the business of import, export and general merchants, agents in respect of aeroplanes, hydroplanes, airships and other aircraft, private and commercial motors, etc. Directors: W. P. G. Stephens (permanent managing director), 5, Bank Street, Newton Abbot; Mrs. I. Stephens, 5, Bank Street, Newton Abbot; Miss W. M. Dart, 183, Sidwell Street, Exeter.

SOUTHERN AERO CLUB, LTD., Shoreham Aerodrome, Shoreham, Sussex.—Capital £100, in 1s. shares. Objects: To establish, maintain and carry on a club or clubs, etc. Permanent directors:—F. G. Miles, Stafford Bungalow, Old Shoreham Road, Hove (director, Southern Aircraft, Ltd.); Nancy B. Birkett, 112, Western Road, Hove (secretary of Southern Aircraft, Ltd.); M. H. Volk, Little Grange, Roedean, Sussex (director of Southern Aircraft, Ltd.); Volks Electric Railway, Ltd.; Magnus Volk, Ltd.; and Downland Car, Ltd.).

WELSH AIRWAYS, LTD.—Capital £100, in 1s. shares. Objects: To carry on and make arrangements for air transport services of all kinds, etc. Permanent joint managing directors:—P. Carpenter, Ty-Saer, Chargoat Road, Cardiff; T. Jenkins, The Rise, Waterloo Road, Cardiff.

AERONAUTICAL PATENT SPECIFICATIONS

(Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors. The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

APPLIED FOR IN 1929

Published January 8, 1931

- 27,494. T. R. CAVE-BROWNE-CAVE. Cooling of lubricating-oil for aircraft engines. (339,650.)
27,555. A. J. F. DE BAVAY. Aircraft. (319,613.)
27,970. J. N. LEWIS. Flying boats or ships. (339,687.)
30,058. J. A. BULL. Torpedoes for launching from a flying machine. (339,709.)

APPLIED FOR IN 1930

Published January 8, 1931

- 2,757. IMPERIAL AIRWAYS, LTD., HUMPHREY, G. E. WOODS, and H. E. HALL. Sparking-plugs for i.c. engines. (339,849.)
4,235. H. SUNDSTEDT. Power systems for aircraft. (339,871.)
6,118. S. E. SAUNDERS. Boat hulls, seaplane bodies, etc. (339,886.)

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